

**ON TEST**  
**iMac 5K**  
**iPad Air 2**  
**Mac mini**  
All Apple's new hardware!

**INSIDE**  
OS X Yosemite in detail  
iPhone 6 covers and cases  
Pixelmator for iPad  
Serif Affinity Designer  
RapidWeaver 6  
iPad music docks on test

# MacUser

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with too  
many pixels  
to fit on  
a magazine  
cover



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# BATMAN 3

## BEYOND GOTHAM



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## Too much like work?

### What we talk about when we talk about upgrades

WHEN PEOPLE TALK about what they want from the next iPad, they start by saying they don't really know why Apple keeps making new iPads – their iPad is fine. Then they say maybe it could be a bit lighter, or have a better camera, or come in colours.

The new iPad that Apple has just released addresses all of those points, but it also does something nobody had asked for. It shoehorns 50% more central processor capacity and 250% more graphics power into the even slimmer slab, with twice the RAM and double the memory bus width to make the most of it. On top of this it runs what it launched as the world's first 64-bit operating system for mobile devices. It's the kind of spec you'd anticipate in a 'proper computer', not a tablet. And it clearly reflects the fact that, led by consumer-focused companies, more capable technology is leading users not only to consume but to create. First, they watch videos from anywhere at any time. Then they think: Why couldn't I make that? And finally, they can. The same goes, of course, for music tracks, websites, magazines, even videogames.

This is all good. And yet... Apple has also just released a new Mac mini. It starts at £399, the same price as the iPad Air 2. Unlike the iPad Air 2, it doesn't contain brand new technology specially designed to deliver the very highest performance and efficiency that cutting-edge technology can cram into its case. It contains quite old technology that's only barely capable of running the software installed on it, and is less open to user upgrades to improve it. Remember when PC

makers came up with a class of computer like that? They called it a netbook. Remember what Steve Jobs said about netbooks? 'They're not better at anything, they're just cheaper.' Yes, Tim. Pretty pointless.

It's wonderful that the iPad and apps like Replay, demonstrated during Apple's latest keynote, let anyone shoot and cut films that look cool. Shooting and cutting films of professional **quality**, worthy of the attention of millions in cinemas, at festivals and on paid-for TV networks, is a very different matter. This is the kind of work (not play) that Macs were made for and have served brilliantly for three decades.

Making work is harder than playing. Making systems that enable people to make work is harder than making systems they can play with. But it's terrifically important, because the creation of art depends on the invention of tools. Nobody begrudges Apple the billions it's made by selling to the **many**, not the few. A fact to which it regularly pays lip service, though, is that it's the exceptional few whose work inspires others' play. And they need more **power**, too, to get it done.

The iMac 5K is a sign that Apple hasn't forgotten where the engine of its market lies. But a year after the introduction of the Mac Pro, that range's price and performance are static while the Apple Store lists cut-down Macs and beefed-up iPads. Using its tablet to drive up mobile performance, just because it can, is exactly the right thing for Apple to be doing. Now let's see that spirit applied to the hard work of innovation, not just the play.



Adam Banks is Editor in Chief at MacUser.











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IMAGE: SASCHA PREUSS 'THE HUNT'



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IMAGE: JAMES FRYER (DETAIL)

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IMAGE FERRAN TRAITÉ PHOTOTROLLEY4ORMAT.COM





**This way** Links  
make connections,  
not reproductions

*Copyright confusion  
settled in EU court*

# Linking and embedding – safe at last?

You probably don't consult lawyers before you post a link to a news story on your website, or embed a YouTube video you think might interest your followers. But arguments are still simmering in the courts over when these everyday activities, especially in commercial contexts, may infringe others' rights or even break the law. Recent weeks have brought a further clarification of the rules in Europe – and a new law in one EU country that turns common sense on its head again.

Back in February, the EU Court of Justice (CJEU) was asked to rule on a Swedish case in which journalists wanted to claim payment from an

internet-based subscription service that was publishing links to their work. The service charged a fee to users for collating articles of interest. It found the articles on the web and simply listed them as clickable links.

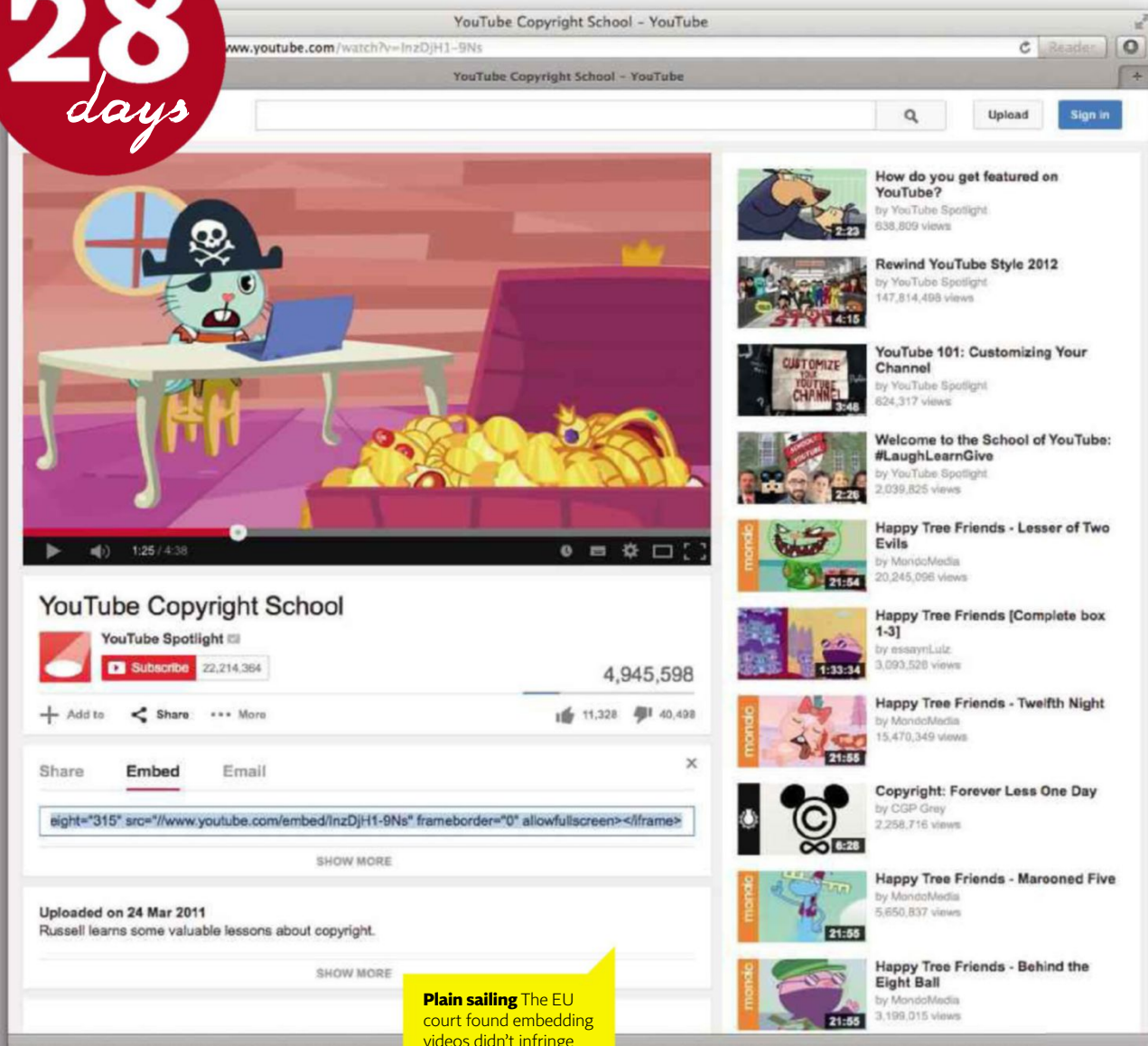
The journalists felt that since their work was involved, they should be paid. No, said the CJEU: the items had been made available online to an audience that 'consisted of all potential visitors to the site concerned', so linking did not 'lead to the works in question being communicated to a new public' and 'the authorisation of the copyright holders is not required'.

In October, a new CJEU decision applied similar reasoning to embeds. In Germany, a company had sought to prevent others embedding its promotional videos in their own website. The embedding was via YouTube's standard method,

[continued on p12]

**THE LINKED ITEMS  
WERE AVAILABLE  
TO 'ALL POTENTIAL  
VISITORS' ALREADY**

28  
days



[continued from p11] appearing in a frame in the website, served from YouTube.

The court was asked to rule because the EU Copyright Directive of 2001, which harmonised many aspects of intellectual property laws as they applied to digital media, had little to say about embedding, which was not such a widespread issue at the time (YouTube was founded in 2005). According to a preliminary copy of the decision, obtained by TorrentFreak: 'The embedding in a website of a protected work which is publicly accessible on another website... does not by itself constitute communication to the public...

## EMBEDDING DOES NOT CONSTITUTE COMMUNICATION TO A NEW PUBLIC

to the extent that the relevant work is neither communicated to a new public nor by using a specific technical means different from that used for the original communication.'

**THIS SEEMS LOGICAL**, fair and in line with real-world practice. The same can't be said of a controversial new law enacted the same month in Spain. Known to critics during its passage through the country's legislature as the 'Google tax', it requires a royalty to be paid when sites aggregate links to others with snippets of text.

What's especially problematic is that the royalty is compulsory: a site owner can't choose to display a blanket notice saying others are welcome to link for free. So the rule could hit open access projects that want their content widely disseminated. If this seems inexplicably perverse, that's

because the law is part of Spain's process of extricating itself from a previous copyright levy regime, itself a bad solution to the challenges of intellectual property rights online that was eventually ruled illegal by the EU.

Spain should probably pay attention to Germany, where a long-running dispute over linking rights seems to have been resolved by a reality check. Publishing giant Axel Springer wanted Google to stop linking snippets of stories from its newspapers, and after years of legal wrangling, Germany passed its own 'Google tax' law in 2013 that allowed publishers to charge a royalty for this, if they chose to. In October, pre-empting any demand from Axel Springer, Google took its links down – and Axel Springer's traffic numbers nosedived. After two weeks, it decided Google could link after all, free of charge.



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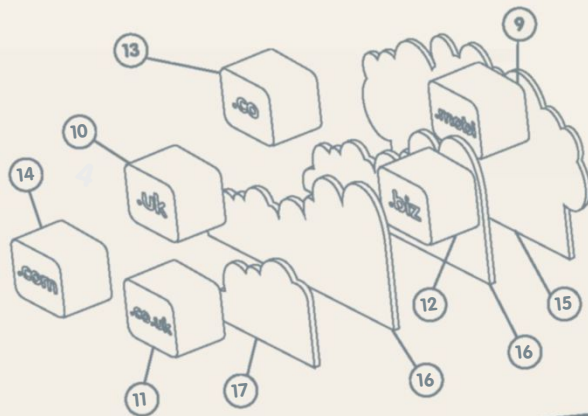
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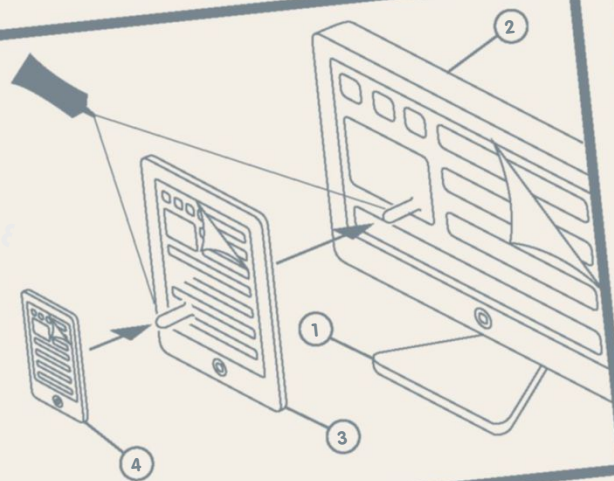
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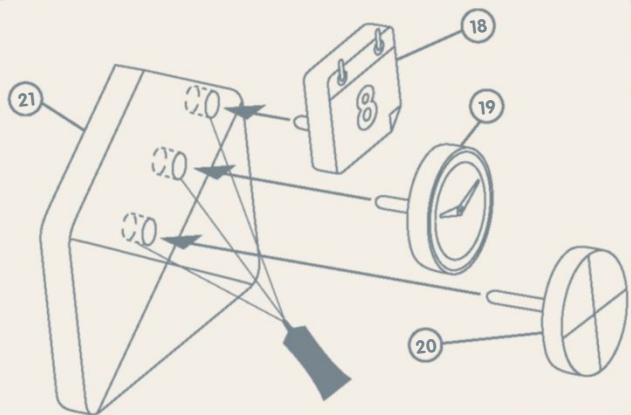
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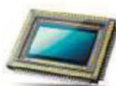
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28  
days

IMAGE GOOGLE MAPS • GCHQ, CHELTENHAM, UK



*New GCHQ boss impatient  
with internet liberties*

**Always on** Mass surveillance is no longer denied, but redefined

# Respecting privacy online? You're in denial, says spy chief

As the guard changes at GCHQ, the UK's government surveillance centre, speeches by the incoming director and his predecessor show a hardening in tone towards privacy objections in the aftermath of Edward Snowden's exposure of secret internet snooping.

Addressing a gathering at the Cabinet War Rooms, Sir Iain Lobban, who headed GCHQ until October, spoke of the 'normal decent human beings' on his staff who 'would sooner walk out the door than be involved in anything remotely resembling "mass surveillance"', stressing that they aimed to 'deliver security at the same time as protecting privacy to the

greatest extent possible'. He argued that a necessary means of doing this was to 'access the internet at scale' – that is, routinely intercept any and all communications – but insisted GCHQ took 'utterly seriously our obligations under Article 8 of the European Convention on Human Rights' to minimise intrusions on individual privacy.

His successor, Robert Hannigan, struck a different note when he wrote in a Financial Times opinion piece that 'privacy has never been an absolute right' and GCHQ needed to 'enter the public debate' about it – presumably not on the side of wanting more. Privacy concerns should not 'become a reason for postponing urgent and difficult decisions', he said ominously. Technology companies were 'in denial' about providing 'the command-and-control networks of choice for terrorists', and must 'support' the security

services (by leaking users' data). The situation was frustrating 'to those of us who have to tackle the depressing end of human behaviour,' Hannigan complained, ringing alarm bells with readers familiar with research into confirmation bias in law enforcement.

**ECHOING HIS REMARKS**, and in an apparent reference to Apple, Metropolitan Police Commissioner Bernard Hogan-Howe told a US law enforcement conference that no 'genuine domestic user' could require 'the levels of encryption and protection we are seeing' – that is, encryption that simply works as advertised.

Yet, an Evening Standard leader pointed out, much of the online activity complained of was in the open, on social networks, providing 'a useful means to track [enemies]' and a forum 'to challenge their arguments'.

**GCHQ SHOULD  
'DEBATE' PRIVACY,  
PRESUMABLY NOT  
ON THE 'FOR' SIDE**



Order your Jony Ive World Tour 2014 T-shirts now (only available in grey)

During the Steve Jobs era, Jonathan Ive, the British product designer promoted by Jobs to lead Apple's hardware strategy, was painted as an almost reclusive character, poring over aluminium samples in a white lab while his mentor yelled at people. Today, however, Sir Jony increasingly seems to be stealing the limelight from his shy boss.

Fresh from interviews with Vogue and Vanity Fair, Ive spoke recently at the San Francisco Museum of Modern Art and London's Design Museum. At least, he was nominally at SFMOMA, but due to renovations had to accept its 'Bay Area Treasure' award in a rented ballroom. Still, his presence drew the 'best attendance ever'.

At the Design Museum two weeks later (after our press deadline), Ive was due to discuss 'What next for design?' with museum director Deyan Sudjic. All tickets were sold out.

If you feel bad about missing Ive's insights, watch him in conversation with Vanity Fair's Graydon Carter at [youtube.com/watch?v=ef69BULge-A](https://www.youtube.com/watch?v=ef69BULge-A). Among other titbits, he says the iPhone 6 doesn't feel too big because its edges are nicely rounded. Perhaps the same goes for his role at Apple.



*First Fortune 500 CEO to go public*

**Rainbow warrior**  
Cook pledged to back equality laws

# Apple's Tim Cook: 'I'm proud to be gay'

Writing in Bloomberg Businessweek, Tim Cook, CEO of Apple since 2011, made his first public statement about his sexuality. 'Throughout my professional life, I've tried to maintain a basic level of privacy,' he explained.

'For years, I've been open with many people about my sexual orientation. Plenty of colleagues at Apple know I'm gay, and it doesn't seem to make a difference... Not everyone is so lucky. So let me be clear: I'm proud to be gay.'

'If hearing that the CEO of Apple is gay can help someone struggling to come to terms with who he or she is, or bring comfort to anyone who feels alone, or inspire people to insist on their

equality, then it's worth the trade-off with my own privacy,' he reckoned.

Cook's position – that he was openly gay but chose not to make his private life a public matter – was well known within Silicon Valley. Re/code's more volubly gay Kara Swisher was unsurprised by but approving of his 'epic coming-out essay'.

Notably, Cook spoke not only for himself but for Apple when he added: 'The company I am so fortunate to lead has long advocated for human rights...

'We've taken a strong stand in support of a workplace equality bill before Congress, just as we stood for marriage equality in our home state of California... And I will personally continue to advocate for equality for all people until my toes point up.' In words inspired by Robert F Kennedy and Martin Luther King, Cook concluded: 'We pave the sunlit path toward justice together, brick by brick. This is my brick.'

**'THE COMPANY I LEAD ADVOCATES FOR HUMAN RIGHTS AND EQUALITY'**



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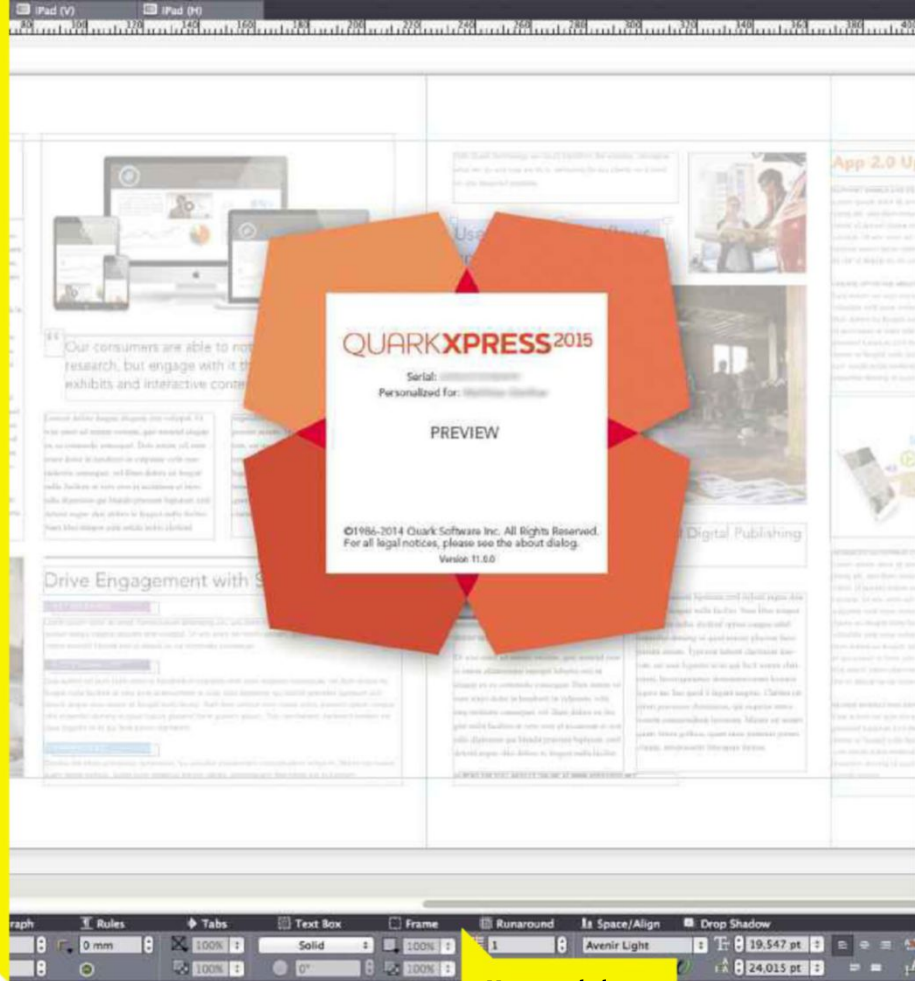


WireLurker exploit targets iOS via Mac – but don't panic

A type of malicious software has been identified that can reside on a Mac and install unauthorised software on an iOS device connected to it via USB, even infecting stored iOS apps in a virus-like way. Palo Alto Networks, which discovered the 'WireLurker' malware, called it 'a new era' because iOS's 'walled garden' has always prevented such attacks. Apple announced (six months late) that it had blocked the apps affected.

WireLurker was a long way from achieving the kind of stealth you might associate with a virus. For it to work, the user had to download an infected Mac app from the Maiyadi App Store, an unofficial Chinese source; reduce OS X's security settings to permit it to run; manually run it and enter their Administrator password; plug in their iPhone, and agree to install an unrequested provisioning profile that the malware attempted to install on it.

While WireLurker did no known harm, Palo Alto Networks pointed out that it could have been further developed to steal user data, for example. To avoid future threats, don't 'jail-break' your device, install untrusted apps on your Mac, accept provisioning profiles unless you know what they're for, or sync or charge your iOS device with unknown USB hardware.



Version 11 will be QuarkXPress 2015

Memory whole  
64-bit code can benefit from more RAM

# New 64-bit Quark to arrive in the spring

QuarkXPress, the app that professionalised desktop publishing in the 1990s and now competes with Adobe InDesign, will see a major upgrade in the first quarter of 2015, Quark has announced. A long-awaited move to 64-bit code provides the impetus for performance improvements across the board, including import/export and on-screen rendering.

Quark says it's implemented users' top 10 feature requests, including larger page sizes and custom size presets, user-definable shortcuts, table styles, individual picture re-linking, and the ability to collect a whole project for output. New automation features include footnotes and endnotes, improved Excel

integration, and text variables for elements such as running headers.

As publishers continue to struggle for functionality and profitability in digital editions, QuarkXPress 2015 brings a new option: fixed-layout ebooks. These offer the flexibility and interactivity of digital magazines but without subscription management, and accordingly at no extra cost. For periodicals, Quark's HTML5-based App Studio platform remains a relatively affordable solution.

While the idea of buying software outright may seem almost quaint in the age of the App Store and Creative Cloud, Quark users get the best of the traditional model. Those who paid £959 (£799 plus VAT) for version 10 can move up to QuarkXPress 2015 for only £199; buying 10 now gets you the upgrade free in the spring. Each purchase can be installed on OS X or Windows and works indefinitely with no further fees.

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# Just take our money already, Apple Pay users tell US retail giants

When Apple demonstrated its own new point-of-sale payment system during the launch of the iPhone 6, the obvious question was 'Why has no-one done this before?' A clue to the answer was already present in the announcement of a list of retailers who'd agreed to support the scheme: even though it was based on users' existing credit and debit cards and standard contactless

till points, Apple Pay (which is only available in the

US so far) wouldn't actually function unless card issuers, processors and merchants all opted to support it. While many have been happy to do so, it turns out that a very significant group are not – and that's because while Apple Pay is purely and simply designed to make secure transactions effortless, these big businesses favour a system that lets them collect more data about the customer.

The rival system they're adopting, called CurrentC, is being rolled out by MCX, which bills itself (if you'll pardon the pun) as 'the only merchant-owned mobile commerce network'. Members include Best Buy, Old Navy and Target as well as some brands familiar in the UK, such as 7 Eleven, Dunkin' Donuts, and Asda owner Walmart.

At least one major retailer, CVS, began accepting Apple Pay but then pulled the facility, amid protests from customers. MCX CEO Dekkers Davidson admitted that an exclusivity agreement was in place that obliged merchants to reject payments from alternative app-based systems during the launch phase of CurrentC, but told The Verge this would only be in place for 'months not years'. Those who did support Apple Pay could expect to be last in the queue to get CurrentC.

CurrentC was invented to get around the merchant fees charged by card processors such as VISA. Payments are taken directly from the user's bank account, incurring lower fees.

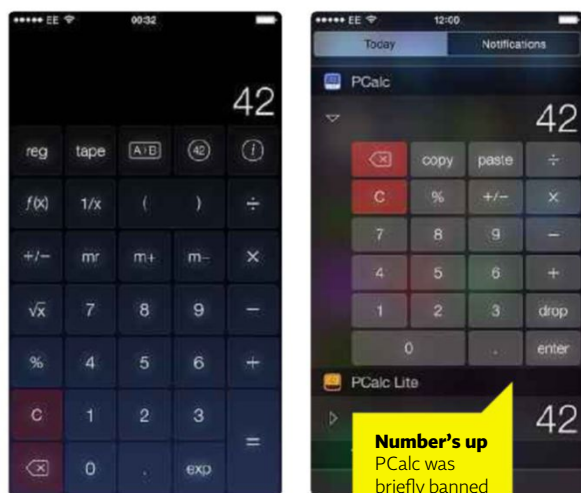
To make the payment, the user scans a QR code generated on the till point, or vice versa. It seems fiddly compared to Apple Pay, where the user just places the device near the till with their finger on the Touch ID button. But

MCX allows the retailer to link transactions to the customer's loyalty card – a crucial source of marketing data.



**Pipe the payer**  
Apple Pay relies on merchant support





# Miscalculation by Apple turns widget into boomerang

Although impressive for a one-man developer, it wasn't especially surprising that James Thomson's PCalc was listed among Apple's first set of featured apps offering iOS 8 Notification Center widgets. The app has been around on the Mac for 20 years, and quickly gained a user base when it arrived on iOS. The new widgetised version lets users do quick calculations in Notification Center without having to open the app – a bit like OS X Spotlight crossed with iOS 8's quick reply.

Yet the App Store then turned around and rejected the already approved and featured app, because 'widgets mustn't do calculations'. The user could enter the calculation, Thomson was told, but must then be dropped back into the app to see the result – not very handy at all.

If Apple had 'Sherlocked' PCalc by building its own calculator into iOS 8's Notification Center, that would have been understandable (and there might still be a place for PCalc's widget regardless – after all, iOS already comes with a calculator app, it's just not as nice.) But not doing so, while killing a third-party implementation, seemed to help nobody and miss the point of widgets.

Eventually this struck Apple too: days later, the decision was reversed again, with sources at the company telling journalists (privately, of course) that PCalc and other widgets *would* be allowed to perform calculations in Notification Center.

A happy ending – but double U-turns are no substitute for actually thinking through and publishing a coherent policy, especially when some independent developers' livelihoods may stand or fall on Apple's arbitrary approval.

## [WHISPERS]



### Apple 'most secure'

The Electronic Frontier Foundation (EFF), a non-profit digital civil liberties organisation co-founded in 1990 by the Grateful Dead's John Perry Barlow after the FBI investigated him on false suspicion of liberating Apple source code, has ranked Apple's FaceTime and iMessage 'the best of the mass-market options' for secure messaging. Although 'neither currently provides complete protection against sophisticated, targeted forms of surveillance', they beat Google, Facebook, Yahoo chat, Secret and WhatsApp by offering end-to-end encryption. Only specialist secure tools such as CryptoCat scored higher. The full results are listed online at [eff.org/secure-messaging-scorecard](http://eff.org/secure-messaging-scorecard).

Both FaceTime and iMessage dropped just two points out of a possible seven: the identity of recipients couldn't be verified, and although it was audited, the source code wasn't available for public examination.



### iOS 8 limps to 50%

One statistic you can bet on hearing in any Apple keynote is how many iOS users have installed the latest version of the OS. While Android users are often unable or unmotivated to upgrade their operating system, the ease of upgrading and compatibility with older models means most of Apple's user base usually moves up in weeks.

But after bugs in iOS 8.0.1 made some iPhones temporarily unusable, the adoption rate of iOS 8 seemed to stall. At the iPad launch a month later, software chief Craig Federighi tortuously added iOS 7 and iOS 8 figures to get a number over 90% for 'an OS no more than a year old'. At 48%, iOS 8 itself was well behind previous performance, and as we went to press it had barely crept over 50%, reports said. The moral: don't release buggy updates, Craig. (iOS 8.1 works fine.)



### Cloud confusion

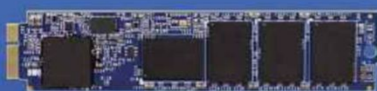
Before her private photos were exposed, actor and Apple user Jennifer Lawrence admitted she wasn't clear how 'the cloud' worked and which of her stuff was in it. If you feel the same way, we're all in good company: security researcher Jeffrey Paul didn't get it either, as he only realised when upgrading to OS X 10.10 Yosemite.

Paul hadn't twigged that even before Yosemite, apps such as TextEdit had been storing unsaved documents in iCloud. When he publicised this, calling it 'unacceptable', cryptographer Matthew Green admitted he'd also been shocked to find TextEdit items in the cloud, reported the Guardian. Although no-one but the user should be able to see the files, in an era of mass surveillance Apple's online auto-save was 'dangerous and poorly documented', blogged security expert Bruce Schneier.

To prevent a new document being stored in the cloud, go to File > Save immediately after creating it and choose a location on your hard disk, not 'iCloud'. You can also untick Notes in System Preferences > iCloud to prevent the Notes app syncing via Apple's servers.

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[EXPLAINER]

*The Steve Jobs movie*

**True to life** Jobs (left) and Wozniak in a scene from the film, probably

# 'It's not the story of Steve Jobs'

**Wait. Isn't this supposed to be a slot where you usefully explain a serious topical issue?**

Yes. But it's been a difficult month, you know.

**Whatever. OK, this film about Steve Jobs. Didn't they make it last year?**

You're thinking of the Ashton Kutcher vehicle Jobs (originally jOBS, so it could have been worse), notable for Ashton Kutcher looking quite like young Steve Jobs but also for howlers like young Steve Jobs explaining computers to Steve Wozniak.

**Seems legit. But this is not the Steve Jobs film you're looking for?**

No, that mildly amusing but critically mauled farrago was just one of any number of putative biopics in the works since the Apple founder's death in 2011. The big one, supposedly, is Sony's, for which the company has bought the rights to Jobs' official biography, by Walter Isaacson. This is being adapted by Aaron Sorkin, writer of *The Social Network* and creator of *The West Wing*. Rumours that the film will be titled *The Steve Jobs* are unconfirmed.

**And what is confirmed?**

That's the problem: as fast as Sony attaches names to this project they seem to fall off again, like hastily applied Christmas tree ornaments. With filming due to begin in the spring, it's beginning to look worrying. Originally, the film was to be directed by David Fincher, who helmed *The*

**AS FAST AS SONY ATTACHES NAMES TO THIS, THEY FALL OFF AGAIN**



Social Network as well as thrillers including *Se7en* and this year's *Gone Girl*. Then he was out and Danny Boyle, of *Slumdog Millionaire* and the Olympic opening ceremony, was in.

#### Didn't he direct *Trainspotting*?

Yes, but that joke about computer nerds that you have in mind is several decades past its sell-by date.

#### Suit yourself. Whoever does direct it, what's this film going to cover?

Good question. Joshua Michael Stern's 2013 film – scripted by Matt Whiteley, a staff writer at the firm whose boss produced it – raced all the way from the 1970s to the 1990s.

#### Like Ashton Kutcher's love life.

I see what you did there. By contrast, Sorkin's script, which was finished months ago, focuses on just three moments – played out in real time – preceding the launches of the Mac, the NeXT Cube and the iPod.

#### Hmm. High-concept. Well, that just leaves the big question: who's going to play Steve?

Leonardo DiCaprio – or not, because he's taking a break. Ben Affleck – or not, because he's doing *The Accountant*. Or Matt Damon or Bradley Cooper, except that nobody actually knows if they've been asked. Or Christian Bale, who Fincher originally wanted, except that he's reportedly, um, baled. The latest speculation surrounds Michael Fassbender, known to audiences as young Magneto, kinky Carl Jung, the robot one in *Prometheus* and the one with the papier-mâché head in *Frank*.

#### So all we really know is that it'll be a biopic of Steve Jobs.

That's clear, at least. As Sorkin told actor/director Jon Favreau in a Tribeca Film Festival interview: 'It's not a biopic. It's not the story of Steve Jobs.'

#### Oh. I think I may be starting to see why this film has problems.

Yep.

## British suspects arrested in 'dark net' takedowns

Silk Road 2, the reincarnation of the infamous online marketplace shut down last year over its use for activities including drug dealing, was among 400 websites taken offline in November in an international police operation that also resulted in 17 arrests, six of them in the UK. Around \$1m in Bitcoin was also seized. The sites were believed to be facilitating sales of illegal drugs, guns and criminal services.

Blake Benthall, a 26-year-old from San Francisco, is in custody after being identified by police as the suspected operator of Silk Road 2. His arrest echoes that of

Ross William Ulbricht a year ago. Ulbricht, 29, had been sharing a flat under the name of 'Josh' with roommates who knew nothing about him except that he was always on his computer. He's currently on trial for crimes related to his alleged operation of Silk Road under the handle 'Dread Pirate Roberts', which he denies.

Europol cybercrime chief Troels Oerting told the Guardian it was significant that 'dark net' sites, using the Tor network to conceal their identities, had proved 'neither invisible nor untouchable'. The news may not be so encouraging for legitimate users of Tor, which is funded by the US government, who rely on their privacy from enemies including oppressive regimes, criminals, and organisations against whom they act as whistleblowers.

**400 SITES WERE BELIEVED TO BE FACILITATING ILLEGAL ACTIVITY**



**Even darker now**  
Hidden sites were targeted by police

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For stockists, see manufacturers' websites, Google the product name or try [amazon.co.uk](http://amazon.co.uk)



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## Native Union CLIC Wooden

Real wood shell cases crafted from American timber. The unique grain of each unit is sanded by hand. Choose from a variety of colourways including White/Cherry, Navy/Cherry and Pink/Walnut, as seen here.  
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## Thule Gauntlet

When your iPhone needs serious protection, this case is easy to snap and has a super-slim profile, yet its unique moulded texture, grippable contours and integral bumpers defend all parts of the device from knocks and scratches.  
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### Griffin Wallet

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### iChic Gear Little Marcel

Available as snap cases, folios, iPhone socks and more, the new Little Marcel designs for iPhone 6 are irresistibly, well, chic. From **£20** • See [ichicgear.com](http://ichicgear.com)



### OtterBox Defender

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### Griffin Reveal

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### NueVue Case

Most cases are all about preventing your iPhone getting chipped or scratched. This one aims to stop it getting dirty. An antibacterial coating kills 99.9% of germs, while the microfibre lining acts as an automatic screen clean on the way in and out. The snug pouch provides shock resistance too, and comes in a range of stylish colours. **£29** (faux), **£30** (leather) • See [nuevue.com](http://nuevue.com)



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## Kenny Hemphill

**‘Its market is particularly competitive and more price elastic than the top end, so the mini is always going to be more vulnerable to competition than the Air.’**

HOW DO YOU solve a problem like the iPad? Apple’s tablet – a beautiful piece of engineering, loved by everyone who uses it, and still ahead of the best the competition can offer – is struggling. Apple’s recent financial results, which covered the June to September quarter, showed significant gains for the Mac and healthy iPhone sales, but iPad sales fell. Again.

At first glance, it’s mystifying. The iPad Air was, until the release of the Air 2 in October, the best iPad Apple had produced. Accompanying it in Apple’s tablet line-up at the time was the iPad mini 2. That was also a significant improvement on its predecessor; it was the first mini to feature a Retina display. And yet Apple sold fewer of those two iPads combined than it did the iPad 4 and iPad mini a year earlier, despite the fact that the iPad 4 was only a minor update to the iPad 3.

Apple doesn’t break sales down by product, only by category, so we can’t tell if the iPad mini 2 or the iPad Air are to blame for the fall in sales. It’s worth remembering, though, that the iPad mini 2’s predecessor was Apple’s first 7in tablet and may have accounted for all the pent-up demand that had accrued as customers waited for Apple to produce a smaller and cheaper version of its tablet, meaning that it actually achieved more than a year’s worth of sales in its first 12 months.

With little new demand, and value-conscious consumers unwilling to upgrade after only a year, not to mention increased competition from Amazon, Google and Samsung, perhaps the mini 2 never stood a chance. The market in which it’s sold is particularly competitive and, one assumes, more price elastic than the top end, so the mini is always going to be more vulnerable to competition than the Air.

Perhaps that’s why Apple invested so little in this year’s model. But for Touch ID, there’s nothing to differentiate the mini 3 from the mini 2. It might also explain Apple’s decision to launch two large-screen iPhones.

The 6 Plus is unwieldy as a phone, but a brilliantly portable small tablet. And one with which it’s much more comfortable to take photos and video than with an iPad.

That’s an important point. Photography and, increasingly, videography are the smartphone’s killer apps. They drive not only sales, but, as tech-watcher Horace Dediu pointed out on his blog, ensure there’s never a shortage of demand for faster processors and more storage. As the sensors on phone cameras get better, they shoot images that have bigger file sizes and need more on-device processing. And then they’re shared online, which requires yet more storage. On the other hand, giving people more power without a reason to use it doesn’t create demand, as Dediu also pointed out. ‘People don’t naturally have exponentially increasing needs. For them to absorb this new power, it has to be couched in new uses,’ he explained.

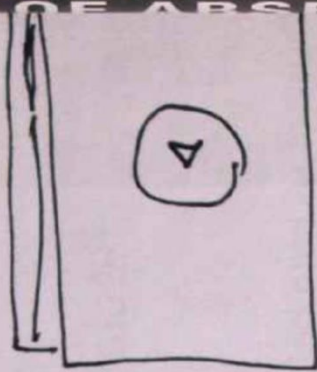
On the iPhone, the new uses are the increasing abilities of the camera. The iPad, which has cameras but isn’t used to take photos anywhere near as often as the iPhone, has new power but no new uses, at least for most of its target market.

Sure, some iPad owners run apps and perform functions that drive the processor hard and use up most of the available storage, but most don’t. For most of us, the iPad has been ‘good enough’ since the iPad 3 brought the Retina display in 2011. Add to that the fact that it’s not a fashion accessory, in the way the iPhone has become, and there isn’t a compelling reason to upgrade.

How Apple overcomes that won’t define the future of the company – that’s wedded to the fortunes of the iPhone – but it will dictate the size, shape and features of the iPad in years to come. And the existence of three separate generations of iPad mini in Apple’s line-up suggests that it’s a long way from finding a solution.

Kenny Hemphill is MacUser’s news editor. He’s been reporting on Apple since the acquisition of NeXT and Steve Jobs’ return to the company.

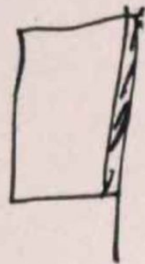
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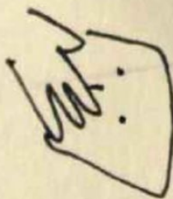


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## Daniel Benneworth-Gray

‘With no Zeitgeisty chitter-chatter to keep me up to speed, I’m in the dark about all the latest impending wars, cat memes and conscious uncouplings.’

‘ONE DOESN’T SEE teenagers staring into space any more... Strange and wonderful things occur to us in those youthful time snacks, those brief reprieves when the fancy wanders ... I fear we are the last of the daydreamers.’

I’ve picked up Michael Harris’s new book, *The End of Absence* ([endofabsence.com](http://endofabsence.com)), and I can’t put it down. Essentially, it’s about how those of us born before 1985 will be the last to remember what life was like before the internet became everything. He laments the loss of the nothingness now occupied by constant connection, of a time before empty moments were filled with duties to social networks, inboxes and ubiquitous trivia.

I’ve recently given my online life a bit of a spring clean to wrestle back some control. Dust-gathering accounts were scrapped, mailing lists unsubscribed from, redundant social connections severed. Untethering from all of this digital baggage was remarkably satisfying. But I want to go one step further, just to see if I can. I will embrace the absence I used to know. I will go without internet for one week.

It is Monday and I am offline.

Already the hole in my daily routine is noticeably vast. Just because I’m neglecting usual online habits, it doesn’t mean I’m not picking up my iPad every five minutes. Only now I’m obsessively checking the status of what I’m missing. Little red badges taunt me in increments. One boasts 50 notifications already. What’s going on out there? Who’s saying what? How far behind am I? Am I needed? Am I missed?

It is Tuesday and I am mostly offline.

Already there are compromises, the modern things leaking through the cracks in my resolve. For good reason, though: socio-technological experiments are all well and good, but I have a business to run and a son to

raise. I permit myself a single daily visit to my inbox and as much iPlayer as is necessary. How anyone is expected to parent without Shaun the Sheep on tap is beyond me.

(There are numerous other exceptions, tendrils of the internet happy to go about their business without human interaction: constant up-and-down traffic from Dropbox, iCloud and Backblaze; the App Store keeping things up to date; Adobe things doing whatever it is that they do.)

It is Wednesday and I am offline.

I have a go at staring into space. I used to be quite good at this. It was very nineties. But now it feels unfamiliar, disconcerting. As the twitchiness of inactivity abates, my mind clears a little, makes room for thought. I ponder what my son – a digital native – would make of this analogue holiday. I’m reminded of a quote by William Gibson: ‘Our children will find our distinction between the real and the virtual a rather quaint notion’... or something along those lines. Or maybe it was JG Ballard? Without being able to Google it, I have no way to verify who said what. My memory has been outsourced, all acquired knowledge and trivial tidbits shipped off to a server in the desert.

It is Thursday and I am offline. And fine.

I receive a text message from a concerned friend: ‘Is everything okay? Where are you? What’s wrong?’ It’s good to know that somebody has noticed my absence.

It is Friday and I am scared and confused.

I feel like a misplaced time traveller, sent back to a more innocent time. Or perhaps sent forward, lacking the necessary tools to properly appreciate the marvels of this future age. Either way, I am disconnected from the world around me. With no news feeds or Zeitgeisty chitter-chatter to keep me up to speed with the events of the day, I’m in the dark about all the

[continued on p34]

[continued from p33] latest impending wars, cat memes and conscious uncouplings. I venture outside to find me a newspaper from a shop, only to be met with the headline 'UK'S FATTEST WOMAN EATS FRIDGE AND DIES.' Without an immediate opportunity to comment or share, I have no idea what to do with this information. My mind is left to boggle in solitude.

It is Saturday and I am offline.

I delve further into *The End of Absence*, a rare occasion on which a book has my undivided attention. I'm not telling anyone on Twitter that I'm reading it; I'm not dipping into my inbox; I'm not Googling tangential thoughts inspired by the text. It's just me and the words.

Good words they are too. Harris has included a glossary of terms relating to how we live now (much like the cultural tropes categorised in the footnotes of Douglas Coupland's *Generation X*, a book from a simpler time). He talks of 'phone burrows', 'flash card confessionals' and 'cloud faith'. The most pertinent to my self-imposed digital abstinence: 'Going Walden – the often ill-conceived decision to live without connective technologies for a period of time in order to cleanse the spirit.'

It is Sunday and I'd really like to not be offline now, please. I'm done. My spirit is fine now. I want back in. Don't make me endure any more of these empty moments. There's just so much... nothing. I'll only check emails once a day. I won't tweet every unfiltered observation that springs to mind. I'll watch films without keeping one eye on IMDb. I'll be good.

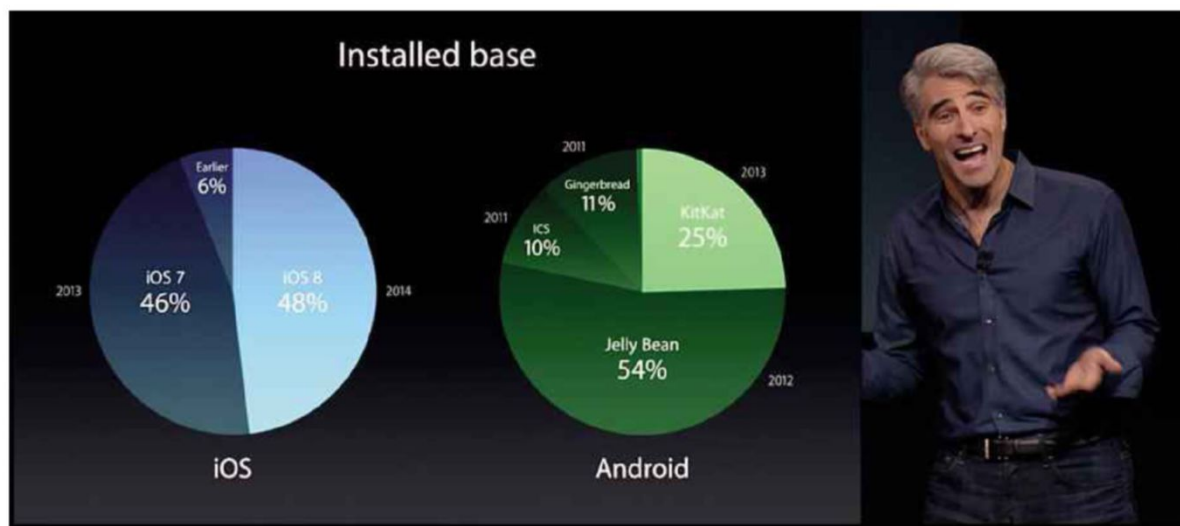
It is Monday and I am online.

I've survived. Woolly parental duties and the plonk of mail on my electronic doormat aside, I haven't been online for a week. If I am to be one of the last to understand and appreciate absence, this holiday in the real world has felt surprisingly precious. And I'm happy to report that I'm still capable of some quality offline day-dreaming. I'd forgotten how enjoyable idleness can be.

But now I have a lot of catching up to do: scrawled notes are scattered about, reminders of thoughts and queries that sprung to mind and couldn't be explored further. A week of internet displaced to this morning. So, what are cats up to these days? Tell me everything.

Daniel Benneworth-Gray is a designer and writer best known for his book covers. He blogs at [danielgray.com](http://danielgray.com).

## Facts and figures iOS 8's installed base race



Whether due to the botched release of its first minor update, the rumblings about missing features (notably HealthKit, which had to be bolted on late), the confusion around iCloud Drive arriving on iOS before the Mac was ready for it, iPad users waiting for new devices, or just an outbreak of apathy, iOS 8 was slower to be adopted by existing users than Apple is used to seeing. This presented software chief Craig Federighi with a problem in the iPad keynote. It was a month after the release of a new iOS; there had to be a chart showing a solid majority of owners already using it.

But the pie was less than half full. In a flash of inspiration, Federighi added a slice for iOS 7 adoption too. After all, it was less than a year old, so... all right, it was a bit more than a year old, but it came out the previous year, OK? And thus was born the 'using an OS released in the past year' statistic. We weren't the only journalists rolling our eyes at this point, but as transparently tortuous as the spin was, if it masked anything it was only that iOS really had nothing to apologise for. Only 25% of Android users are on the latest version, KitKat, just over half the proportion of Apple's mobile device users on iOS 8. And at the time of speaking, KitKat had had almost a year to gain share. iOS 8 had had almost a month. Just over half of Apple's users were on a version a year old; just over half of Android's users were on a version two years old.

Bringing the user base along as your OS progresses is genuinely important – app developers won't implement the new features the operating system has to offer unless enough of their potential customers are using it – and uptake is also a proxy for other interesting things, like whether your customers are actually using the device they bought from you or have chucked it in a cupboard. And it's clear iOS is still winning on these metrics. It may have taken several whole weeks to limp past 50% adoption, but neither iOS 8 nor Apple are anywhere near looking like a damp squib.





## Howard Oakley

**‘Hyperbole provides the publicity sought by security researchers, which brings them business, by disclosing vulnerabilities that had not been previously exploited.’**

IT IS TEMPTING to blame the Victorians for hyperbole, but examples abound in ancient Hebrew and Shakespeare. Nearly two millennia ago, Quintillian observed that ‘there is in all men a natural propensity to magnify or extenuate what comes before them, and no-one is contented with the exact truth.’ It is disappointing that both published and social media have so seldom been able to find contentment in plain truth.

Shortly after the iPhone 6 launch, the everyday barrage of hyperbole reached fever pitch, with ‘Bendygate’ turning out to affect a handful of the phone’s ten million new users, the iOS 8.0.1 cockup allegedly causing a large fall in the US stock market, and ‘hundreds of millions’ of users ‘at risk’ from the Shellshock ‘bug’.

Shellshock is a serious risk, but to only a tiny fraction of OS X users, at least in its current form. Relying on flaws in the ‘bash’ command shell, which does not normally run as a background process, the only OS X systems it is likely to put at risk are those running certain web services and similar for open internet access.

If you are still worried, leave Activity Monitor open and watch how seldom bash appears in its list of running processes. Tips to allow you to compile your own patched bash and install it were available almost immediately, and Apple was swift to release a full update on 29 September.

Similarly, although bash does apparently exist inside iOS, any theoretical vulnerabilities in it would not have been exposed unless you had broken jail and were doing some pretty reckless things with your iPhone.

There is a far more interesting and concerning story hidden behind Shellshock, though: given the extreme age of these flaws in bash, why disclose them now, and why is this only now being exploited?

The explanation seems to lie in the nature of computer security ‘research’ and its true impact on vulnerabilities. Generally speaking, most security problems

only become exploited when their details have been published. ‘Researchers’ thrive and win clients on the basis of the publicity associated with the vulnerabilities that they discover and publish. It is a bit like medical researchers discovering a disease from which nobody has suffered, following which the disease becomes a major threat to our health. Only we would all know the solution to such diseases: stop funding the research and the diseases would stop appearing.

So hyperbole in poorly researched news stories provides the publicity sought by security researchers, which brings them business and financial reward, by disclosing vulnerabilities that had not been previously exploited. It is just as well that security researchers do not have the same stringent ethical supervision that oversees all medical research.

By contrast, accounts of car safety recalls are surprisingly accurate, if not understated. At about the same time, Vauxhall initiated a recall over a serious steering defect affecting about 3,000 vehicles. Rather than making sweeping exaggerations, news items were careful to stress the small number affected. Spend some time browsing the database [atdft.gov.uk/vosa/apps/recalls/default.asp](http://atdft.gov.uk/vosa/apps/recalls/default.asp) and you might become alarmed at the number of safety recalls, and the potential severity of some of the defects involved. Yet most vehicle safety issues seem to pass the press without the spread of global alarm and panic, and escape catchy hyperbolic nicknames like Shellshock or Heartbleed.

As a tool of rhetoric, hyperbole is (perhaps ironically) overvalued and grossly overused. To find the ignorant indulging in it is only to be expected, but there is no excuse when those who should know better stoop to repeated use. Its only beneficiaries seem to be the computer security industry and share speculators.

Howard Oakley has used Macs in science and medicine, including software development, and written about it in *MacUser*, for more than 20 years.





**14** million  
**745** thousand  
**600** pixels

Apple's brand new Retina 5K display shows seven times more detail than 1080p HD, and nearly three times more than a 15in Retina MacBook Pro.

And it comes with a free iMac.



#### ← Points of view

The iMac's dot pitch works out at 217 pixels per inch, versus 220 for the 15in Retina MacBook Air

## 27in iMac with 5K Retina display

**£1,999**

3.5GHz quad-core Intel Core i5  
8GB DDR3 RAM (2× 4GB)  
1TB Fusion Drive  
AMD Radeon R9 M290X  
with 2GB video memory  
27in 5120 × 2880 Retina display

4.0GHz quad-core Intel Core i7 +£200  
256GB SSD +£0 (instead of Fusion Drive)  
512GB SSD +£240  
1TB SSD +£640  
3TB Fusion drive +£120  
AMD Radeon R9 M295X with 4GB +£200

RAM user-upgradable up to 32GB

Add one external monitor  
at up to 3840 × 2160 (UHD)  
Built-in display cannot be used as a monitor

SDXC card slot  
4× USB 3.0  
2× Thunderbolt 2/Mini DisplayPort  
Gigabit Ethernet  
802.11ac wifi (802.11a/b/g/n compatible)  
Bluetooth 4.0

FaceTime HD camera  
Stereo speakers  
Dual microphones  
Headphone mini-jack (supports analogue or optical digital output, iPhone headset with mic; digital audio input via USB only)

Magic Mouse or Magic Trackpad  
Apple Wired or Wireless Keyboard

OS X 10.10 Yosemite  
OS X Server +£13.99 from Mac App Store

For  
speed  
test results  
see p47



#### ↑ Memory hole

Like other 27in iMacs, the 5K has a hatch for access to the RAM modules. These should be paired for the best performance. Add two 8GB modules, at around £63 each, to get a total of 24GB for about £125, compared to Apple's option of 16GB for £160. Or replace the original 4GB modules with two 16GB, at around £125 each, to get the maximum 32GB for £230 less than Apple charges

IMAGE: IFIXIT.COM



#### ↑ Bigger, faster, better

The 21.5in iMac is seen here for comparison. The 5K's ports look identical, but it's the first iMac to get the faster Thunderbolt 2 interface, like the Mac Pro

It's true: when you look at the prices emerging for other makers' 5K monitors, they're similar to what Apple is charging for the new 5K iMac. That's not to say it's cheap; but its apparent £550 premium over the basic 27in model is only £240 once you adjust all the specifications to match (even then, the 5K has a slightly faster CPU).

And when you see this screen, £240 is suddenly not going to seem like a lot of money. The obvious question about the Retina display, with its fourfold increase in pixel count, is: can you tell the difference? We saw it for the first time, at Apple's

invitation, in the new conferencing annexe to the Apple Store on Berlin's Kurfürstendamm, which is as good a place as any to see a thing but offered no previous Macs to compare with. Even so: yes, we could see the difference. Such a huge display with such a complete absence of pixellation is quite something to behold.

**IT'S NOT JUST** the incredibly fine dot pitch, either. Thanks to a new panel construction, the image is right there, laminated to the other side of the wafer-thin protective glass. You can very nearly touch it. And thanks to

a plasma deposition process more typical of camera lenses than monitors, the surface is less reflective; this is still not a matt screen, but the mirror effect is noticeably less distracting.

To further boost the sense of hyperreality, the LCD has even deeper blacks and better colour. Our colleagues in the PC Pro labs measured its gamut at a decent 99.5% of sRGB (and Apple says every unit is calibrated to ensure accuracy). Contrast, at 1,197:1, beat the existing 27in by 33%, and brightness exceeded many TVs, let alone monitors, at 446cd/m<sup>2</sup>. Here, though, a concern was raised.





#### ↑ Real estate

The OS X user interface appears at the same physical size on Retina, but sharper. Other scaling options are available if you want to pack more into the screen at a smaller size

A high-end screen will deviate no more than 2-5% in brightness across its area. PC Pro's 5K iMac was around 10% dimmer at the left and right than in the middle. That means the same tone would look slightly different depending on its screen position. Nothing you'd notice in general use, and it might settle down over time, but for colour-critical photo or video work it seems as if it could be better.

Then again... could it? Standard 27in screens of higher quality than Apple's start at over £1,000; the top graphics brands haven't released 5K units yet, but when they do, the prices

will make the 5K iMac look like an impulse buy. For the money, this screen is going to make the vast majority of creative pros very happy indeed.

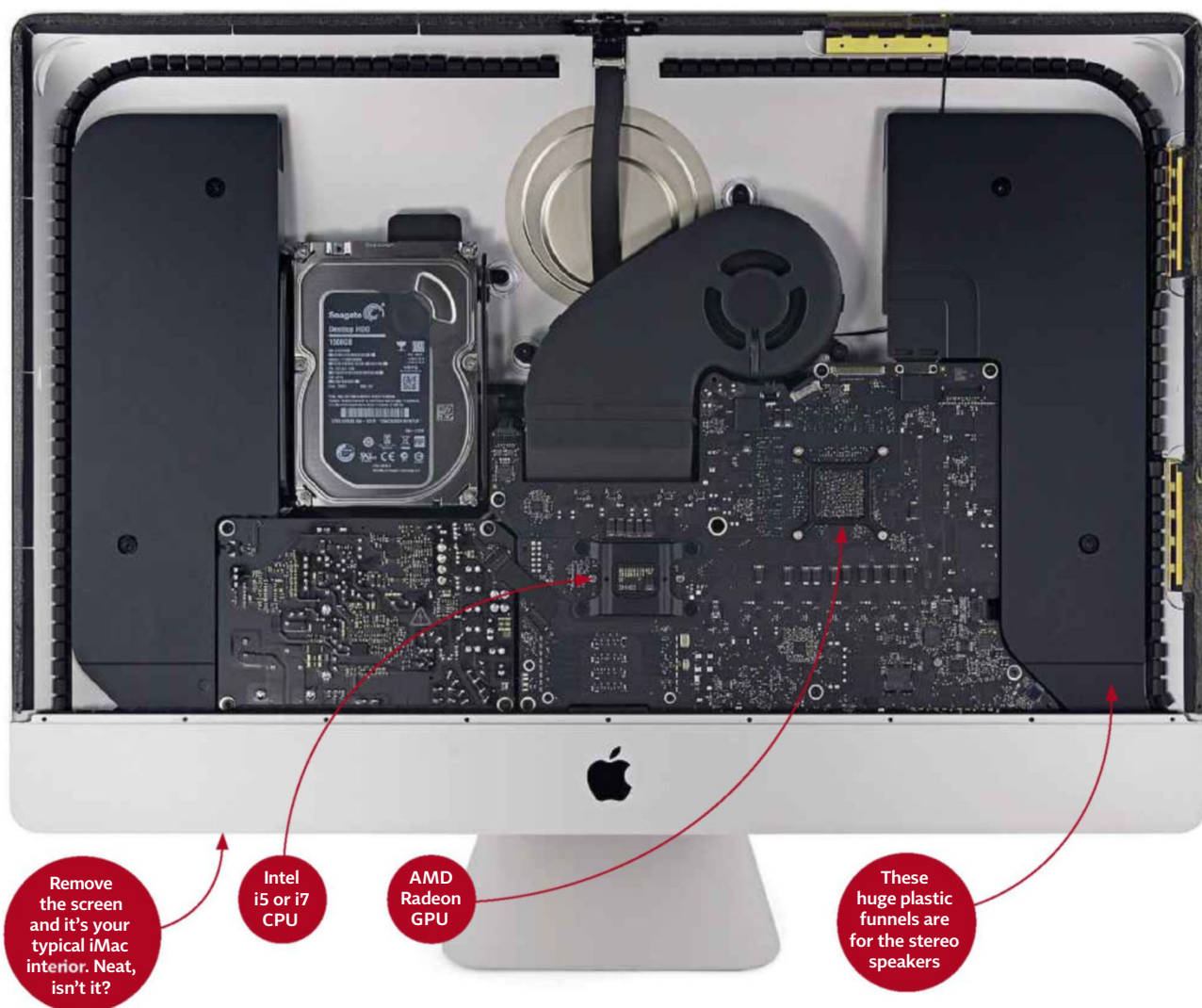
**APPLE HAS CHOSEN** not to give the groundbreaking 5K a brand new case, instead retaining the sculptural 2012 design, with its gracefully bulging rear and knife-edge profile. Except for the screen and upgraded Thunderbolt ports, this is essentially the same machine as the regular 27in iMac, which remains on sale from £1,449.

CPU speeds differ, though, and the standard iMacs have NVIDIA

GeForce GTX graphics, while the 5K model uses AMD's Radeon R9. In both cases, as usual, Apple has chosen the mobile 'M' variants, which trade some performance for lower power draw and heat.

Although you might guess the 5K screen would need a different class of GPU, these NVIDIA and AMD parts are rivals in a roughly similar price and performance bracket. It's not clear if Apple's reason for going with AMD is technical or commercial. The GPUs in the Mac Pro are also from AMD.

Apple provided us with a 5K iMac in its base configuration for testing.



IMAGES iFIXIT.COM (THIS PAGE), DENNIS PHOTO STUDIO (OPPOSITE)

This had a 3.5GHz quad-core Core i5 processor, 8GB of RAM and a 1TB Fusion Drive. A Core i5 is underwhelming in a machine at this price, the first hint that the base configuration, despite its attractive price tag, may not be the one you should buy.

Still, the iMac tore through most of our tests (see p47). In Final Cut Pro X, our Core i7 Retina MacBook Pro transcoded a 4K project for upload to YouTube in one hour, 22 minutes and 45 seconds (marginally faster than a Mac Pro, a quirk we've noted before). The iMac beat it by 1 min 29 secs.

HandBrake is an app that makes intensive use of available CPU cores to transcode video, so here the 8- and 12-core Mac Pros beat all comers. But the Retina iMac's time was almost identical to the quad-core Mac Pro, whose Xeon chip has a 0.2GHz faster clock speed than the iMac's Core i5.

In Cinebench's OpenGL graphics test, the iMac again beat the Mac Pro. But Cinebench hadn't been updated for the Mac Pro's dual graphics cards. Although a Mac Pro with two D700 GPUs managed 87.7 frames per second and the iMac's Radeon R9 M290X 91fps, in the latest apps you'd get better results from the Pro.

**THE 5K IMAC'S** AMD Radeon R9 GPU marginally improved on the GeForce GTX 775M in last year's best off-the-shelf 27in iMac, which rendered at 88.4fps, but fell behind the 780M, that model's top build-to-order option, which hit 104.3fps. Specifying the M295X GPU for an extra £200 should push the 5K back up there, but we have still to test that option.

14 million pixels add up to a lot more work for the GPU in all tasks. Yet we found the base 5K iMac

very responsive. Even with Final Cut showing a 4K project at 100% (leaving enough space for editing tools, though you'd still want a second screen for a heavily populated timeline), the Viewer updated quickly as we scrubbed through, and there was only a small delay when we added more than a handful of effects.

Responsiveness is helped by the inclusion of a Fusion Drive as standard. Unchanged in specification since its introduction in 2012, this consists of a meagre 128GB of fast flash memory (also known as a solid state drive, or SSD) linked to a hard drive; the first files you store go on the SSD, and once it gets near capacity, OS X automatically manages what gets relegated to the slower HD.

A machine aimed at creative pros, however, is likely to have more than 128GB thrown at it straight away,



reducing the benefit. If you're in the habit of storing your work on fast external drives, and only system essentials on your internal, that'll help; but then you might do even better with the 256GB pure SSD option, at the same price. Doubling that adds £240.

What has changed since 2012 is Apple's switch to a PCI Express (PCIe) connection for the flash **memory**, which explains the incredibly fast transfer rates in our storage tests.

**WHAT YOU WON'T** be doing at 5K resolution is playing games. As amazing as that would look, it's not viable yet; even if you could get a playable frame rate in visually rich games like 2013's *Tomb Raider* (you can't), you wouldn't see great results, because the textures in most games aren't made for this resolution.

When we set *Tomb Raider* to its Low quality preset and ran it at the 5K iMac's native 5120 × 2800 pixels, the maximum and average frame rates reported by its own benchmark were just 26.4 and 19.2fps. Reducing the resolution to 3200 × 1800 boosted the minimum frame rate to 34.4, over the accepted comfort threshold of 30fps. Raising the quality to Normal at this resolution dropped the minimum back to 25.5fps and the average to 36.

At 2560 × 1440 – standard 27in iMac resolution, using four of the 5K's pixels for every one in the game – we got 40fps minimum and an average of 53.9fps, the sort of rate at which a game feels fluid. Even when we raised all other graphics settings to maximum, the frame rate held above 30fps, with an average of 42.8.

When ordering, you can upgrade from the 3.4GHz i5 to a 4.0GHz i7 CPU and from an M290X with 2GB to an M295X with 4GB of video RAM, each for £200. We haven't yet been able to test the benefits. As with previous top-end iMacs, creative power users will want both. While the i5 is more adequate than we expected, the i7 is the obvious all-round upgrade.

**WHO NEEDS 5K?** You know, cramming a 4K preview and timeline into one screen (one that's not quite up to grading quality at that) maybe isn't the perfect NLE setup. But this machine does have compelling appeal for video editors. More broadly, you get greater clarity in any task, app support permitting.

With 14 megapixels on screen at once, Photoshop feels quite different. Super-fine type rendering brings InDesign pages closer to the real thing. The iMac, overall, is an even greater joy to use.





## OMG they killed mini!

For friends and family of the most affordable Mac, this new version offers a terrible shock. It's one of those Doctor Who moments when a friend turns around and... they're a Cyberman.

Previously in the four-year history of the unibody Mac mini, its base was a black plastic disc with indents for your thumbs. Twisting this off revealed the inner workings. The RAM was right there, with a diagram to help you swap modules, so you could upgrade the memory at any time, rather than pay Apple's extortionate prices for extra RAM when buying your Mac. If you were more ambitious, after removing

a few more components the main logic board slid right out, revealing the power supply and drives.

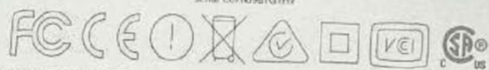
This, then, was the tinkerer's Mac. Not merely a low-end consumer machine, it was favoured by the IT crowd, offering decent performance in a headless unit. The Apple Store always listed a server configuration to suit them, with more hard disk space and OS X Server pre-installed.







Serial C07N/9BTG116V



Designed by Apple in California. Assembled in China. Model A1347 EMC 2840. Contains FCC ID: Q05-BRCM1069 and IC: 4324A-BRCM1069. Rated 100-240V~ 50-60Hz 1.5A. CAN ICES-3 (B)/NMB-3(B).



Enthusiasts loved the mini too, because they knew they could modify it later when their needs changed.

Well, it looks like that's all in the past, because when you finally prise off the indent-free cap from the new model, all you see is a metal plate.

To add insult to injury, this is held on not by just any screws but TR6 Torx security screws – a type so obscure that not even iFixit sells the right tool (they're working on it). Yes, the only way to attack this Cyberman is to call on someone with a special screw-driver. Joking apart, Apple really, really doesn't want you inside this machine.

Underneath that plate, it's even clearer that our old ally has been converted. The two SATA ports, which

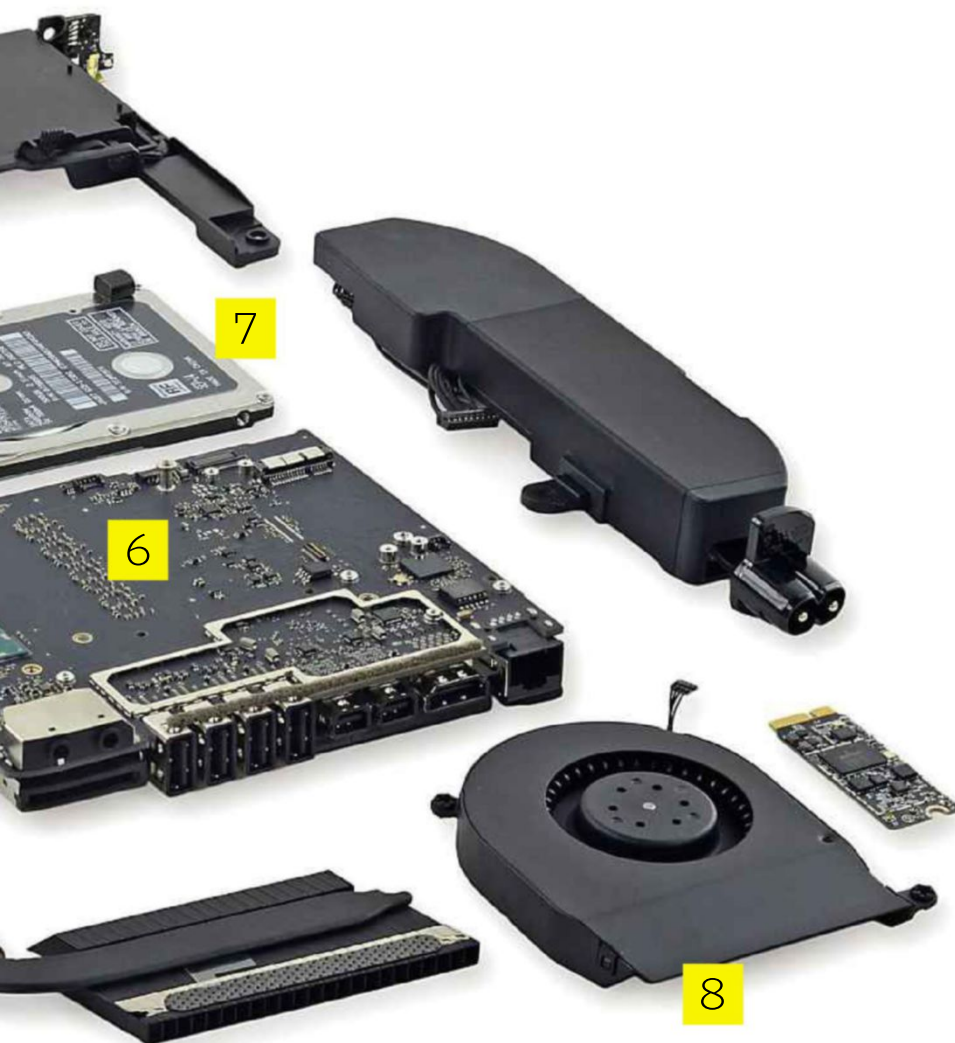
enabled the twin drive configuration that was standard in Server models and an upgrade project for others, have been reduced to one, with a PCIe socket for the SSD option. Worst of all, sliding out the main board (yes, that's still a thing) reveals the RAM chips – soldered directly to it. Removing them is impossible even if you go to the trouble of getting this far, and there are no slots for more.

**WHEN WE ASKED** a helpful Apple technical staffer in Berlin about this backward leap for upgradability, she assured us that most users never upgrade anyway. It's well known that that's true of desktop computer consumers in general, but our own long

experience of Mac mini users differs. Arguably, anyone who's serious about modding their Mac can still do so: once you get past those silly screws, the mini comes apart much as it did before, earning an iFixit repairability score of six – respectable by Apple standards. You can't fit two SATA drives any more, but you can swap hard disks and SSDs, and replace most parts as they fail, keeping your companion alive through time inside its aluminium exoskeleton.

The buyer most likely to suffer, ironically, is precisely the one who isn't interested in upgrading and just wants an affordable Mac. That's because, inside its sealed case, the new base specification of the mini is





## Inside the mini

**1 No entry** This handy metal plate stops you getting into the mini for repairs or upgrades. Wait, that's not handy, is it?

**2 Shell game** The aluminium unibody chassis seems to be unchanged from previous models

**3 Twice over** You now get two Thunderbolt 2 ports instead of the previous single Thunderbolt. One will normally be used to connect your monitor: a Mini DisplayPort cable plugs straight in, or use an adaptor for other digital inputs

**4 TV show** Unlike the iMac, the mini has an HDMI port for output to an HDTV or digital projector. 4K is supported, but only at low refresh rates. It can also take a DVI adaptor to connect a monitor

**5 Central park** The Intel i5 CPU lives here, with its HD 5000 GPU

**6 Memory lane** On the other side of the board here are your RAM chips. But you don't need to know that, since you can't swap them anyway

**7 Hard luck** There's nothing technically wrong with the hard disk in the base mini, but in combination with the small RAM and uninspiring dual-core processor it makes for a less than speedy system. With patience and the right screwdrivers you could swap the drive later for another 2.5in unit; flash storage upgrades should also be possible, though Apple won't be offering them itself

**8 Fan base** The mini was always quiet, and this new cooler promises even lower noise

too low for comfort. It's long been the case that Apple makes mid-range and high-end computers that are good value for their specification and quality. If you want a cheap PC, you can go elsewhere, but if you spend the money to get a Mac, you know it won't disappoint.

This one may disappoint. We can't deny that it's great to see a Mac for £399, but nor can we deny that it's underpowered. The 1.4GHz dual-core Core i5 CPU and 4GB RAM may match the base MacBook Air, but the Air's SSD makes everything quick. When your data's being swapped out to ultra-fast solid state storage, having a bare minimum of RAM (and that's what 4GB is) isn't such an issue;

only users trying to edit huge files in advanced apps will feel the pinch.

**THE PROBLEM IS** that the entry-level mini doesn't have SSD storage. It has a clunky old mechanical hard disk. And the combination of this, a slow CPU and not a lot of RAM is bad news for performance. As luck would have it, it was this configuration that Apple supplied first for testing (we'll update you when we have results from higher spec models – nag us on Twitter @macusermagazine), so we can asses just how bad the news is.

The mini's specification echoes the cut-down 21.5in iMac released earlier this year. The Core i5 CPU runs at only 1.4GHz, down from 2012's

2.5GHz, but it gains from the efficiencies of Intel's newer Haswell chips.

Scores in Cinebench's CPU-based rendering tests were far better than a 75% reduction in clock speed might suggest. In the single-core benchmark, the old mini was rated at 1.2; the cheaper new model scored 1.1, worse but not dramatically so. That's largely due to Intel's Turbo Boost technology, which ups the clock speed when only one core is active. This hiked the 2012 model from 2.5 to 3.1GHz, but the new one gets a bigger boost, from 1.4 to 2.7GHz. In multi-core rendering, the gap is wider, but Haswell stops it growing too large. The old mini, with the earlier Ivy Bridge CPU, scored 2.9; the new one lags a little behind on 2.5.



**Dimensions**  
197 × 197 × 36mm  
1.2kg

**Input devices** (not included)  
Magic Mouse or Magic Trackpad +£59  
Apple Keyboard with numeric keypad +£40  
Apple Wireless Keyboard +£59

Mouse  
and key-  
board cost  
extra

## Mac mini 1.4GHz

**£399**

1.4GHz dual-core Intel Core i5  
4GB LPDDR3 RAM  
500GB hard disk (5400rpm)  
Intel HD Graphics 5000  
(shared video memory)

8GB RAM (total) +£80  
16GB RAM (total) +£240  
RAM is not user-upgradable

1TB Fusion drive +£200

SDXC card slot  
4× USB 3.0  
2× Thunderbolt 2/Mini DisplayPort  
Gigabit Ethernet  
HDMI with multi-channel audio  
802.11ac wifi (802.11a/b/g/n compatible)  
Bluetooth 4.0

Add up to two external monitors  
at up to 2560 × 1600  
HDMI TV or projector at up to:  
1920 × 1080 (1080p) at 60Hz  
3840 × 2160 (UHD) at 30Hz  
4096 × 2160 (4K) at 30Hz

Speaker  
Headphone mini-jack (analogue/optical digital,  
supports iPhone headset with mic)  
Audio line-in (analogue/optical digital)

OS X 10.10 Yosemite  
OS X Server +£13.99 from Mac App Store

## Mac mini 2.6GHz

**£569**

2.6GHz dual-core Intel Core i5  
8GB LPDDR3 RAM  
1TB hard disk (5400rpm)  
Intel Iris Graphics  
(shared video memory)

3.0GHz dual-core Intel Core i7 +£230  
16GB RAM (total) +£160  
RAM is not user-upgradable

1TB Fusion drive +£160  
256GB SSD +£160 (instead of hard disk)

SDXC card slot  
4× USB 3.0  
2× Thunderbolt 2/Mini DisplayPort  
Gigabit Ethernet  
HDMI with multi-channel audio  
802.11ac wifi (802.11a/b/g/n compatible)  
Bluetooth 4.0

Add up to two external monitors  
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1920 × 1080 (1080p) at 60Hz  
3840 × 2160 (UHD) at 30Hz  
4096 × 2160 (4K) at 30Hz

Speaker  
Headphone mini-jack (analogue/optical digital,  
supports iPhone headset with mic)  
Audio line-in (analogue/optical digital)

OS X 10.10 Yosemite  
OS X Server +£13.99 from Mac App Store

## Mac mini 2.8GHz

**£799**

2.8GHz dual-core Intel Core i5  
8GB LPDDR3 RAM  
1TB Fusion drive  
Intel Iris Graphics  
(shared video memory)

3.0GHz dual-core Intel Core i7 +£160  
16GB RAM (total) +£160  
RAM is not user-upgradable

256GB SSD +£160 (instead of hard disk)  
512GB SSD +£240 (instead of hard disk)  
1TB SSD +£640 (instead of hard disk)

SDXC card slot  
4× USB 3.0  
2× Thunderbolt 2/Mini DisplayPort  
Gigabit Ethernet  
HDMI with multi-channel audio  
802.11ac wifi (802.11a/b/g/n compatible)  
Bluetooth 4.0

Add up to two external monitors  
at up to 2560 × 1600  
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1920 × 1080 (1080p) at 60Hz  
3840 × 2160 (UHD) at 30Hz  
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Speaker  
Headphone mini-jack (analogue/optical digital,  
supports iPhone headset with mic)  
Audio line-in (analogue/optical digital)

OS X 10.10 Yosemite  
OS X Server +£13.99 from Mac App Store

This  
is over  
twice the  
market price  
of RAM

Only  
the 2.8GHz  
has larger  
flash drive  
options

To hold down the price, Apple has kept Intel's HD Graphics in this model rather than moving it to the newer Iris chips. The HD 5000 managed Cinebench's Open GL test at 24.5fps, up from 18.6fps on the old HD 4000. But it isn't ready for today's 3D games.

Batman: Arkham City defaulted to a fair 1600 × 900 pixels, but averaged 24 frames per second and maxed out at 33, not really playably smooth. By dropping the resolution to 1280 × 720 we got the average frame rate up to 33fps, but it still fell occasionally to as little as 19.

Tinkering with other graphics settings might just about get you a reliable frame rate at the expense of appearance, but if you're at all

interested in major-league games you should look no lower than the £569 Iris-equipped configuration. Tomb Raider warns that the HD 5000 isn't officially supported, although it runs; we had to put every setting on minimum, and drop to 1280 × 720, to get the average frame rate up to 34.2fps, still dropping at times to 22.6.

The GPU is not even the worst drag on the mini's performance. That honour goes to the 2.5in hard drive, a component designed for decade-old laptops. A modern operating system is constantly accessing permanent storage, not just when you overtly load or save a file, and all the more so when RAM is tight. The base mini's 5400rpm hard disk is not remotely

in the same league as the MacBook Air's flash memory, and the result is a usable but distinctly sluggish desktop experience. Even OS X's own animations, such as when opening Mission Control, sometimes stutter.

**LET'S NOT WRITE** off the mini: it's still a very affordable Mac to which you can add one or more generic screens for a cost-effective system. We'll bring you the verdict on the high-end configurations as soon as we can. The £399 headline price, though, masks some un-Apple-like compromises. As an introduction to the Mac for basic tasks only, it's fine. Anything beyond that, and you'll need to spend more – up front, since upgrading is thwarted.





# Benchmark tests

## Processing Cinebench\*

CB units

- OpenGL (GPU)
- Software/CPU render single-core
- Software/CPU render multi-core

\*Mac mini models tested with Cinebench 11.5, other models with Cinebench R15

This model starts at £4,499

### iMac Retina 5K

3.5GHz quad-core i5/R9 M290X

### iMac 27in Late 2013

3.5GHz quad-core i7/GTX 780M

### iMac 27in Late 2013

3.4GHz quad-core i5/GTX 775M

### Mac mini Late 2014

1.4GHz dual-core i5/Intel HD 5000

### Mac mini Late 2012

2.5GHz dual-core i5/Intel HD 4000

### Mac Pro 8-core

3.0GHz 8-core Xeon/FirePro D700

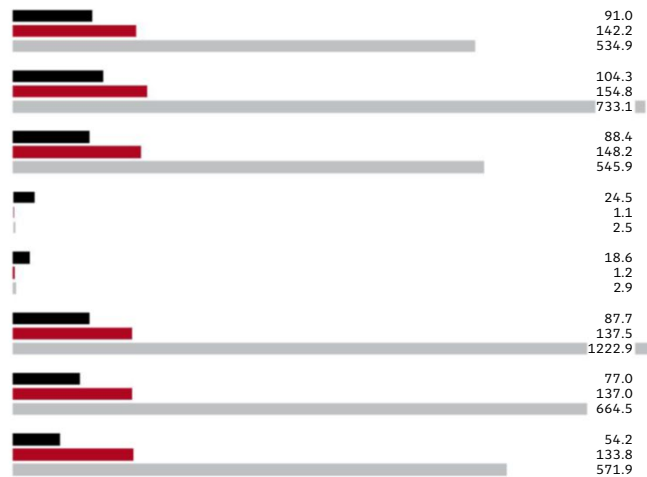
### Mac Pro Quad-core

3.7GHz quad-core Xeon/FirePro D300

### MacBook Pro 15in Mid 2014

2.5GHz quad-core i7/GT 750M

Longer bar = better performance



## Games

### Tomb Raider (2013)

Average frames per second (fps)

■ 'Low' graphics setting ■ 'Normal' ■ 'High'

iMac Retina 5K tested at:

- 2560 × 1440
- 3200 × 1800
- 5120 × 2800

Mac mini GPU not officially supported. Tested at 1280 × 720, all other options minimum

All other Macs tested at 2560 × 1440

### iMac Retina 5K

3.5GHz quad-core i5/R9 M290X

### Mac mini Late 2014

1.4GHz dual-core i5/Intel HD 5000

### Mac Pro 8-core

3.0GHz 8-core Xeon/FirePro D700

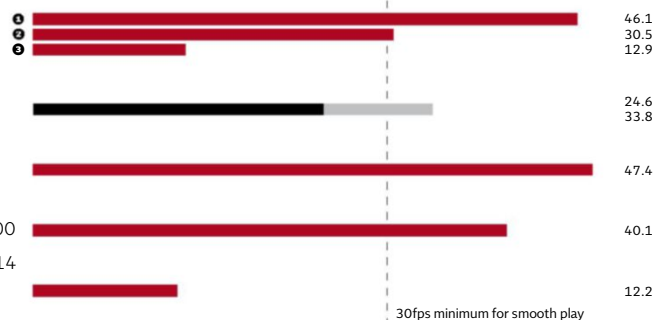
### Mac Pro Quad-core

3.7GHz quad-core Xeon/FirePro D300

### MacBook Pro 15in Mid 2014

2.5GHz quad-core i7/GT 750M

Longer bar = better performance



30fps minimum for smooth play

## Processing

### Final Cut Pro X

Hours : minutes : seconds

Time taken to output 4K project for YouTube (arbitrary project size for comparative results)

### iMac Retina 5K

3.5GHz quad-core i5/R9 M290X

### Mac Pro 8-core

3.0GHz 8-core Xeon/FirePro D700

### Mac Pro Quad-core

3.7GHz quad-core Xeon/FirePro D300

### MacBook Pro 15in Late 2013

2.3GHz quad-core i7/GT 750M

Shorter bar = better performance



## CPU only

### HandBrake

Minutes : seconds

Time taken to convert 4K AVCHD using Apple TV 3 preset (arbitrary file size for comparative results)

### iMac Retina 5K

3.5GHz quad-core i5/R9 M290X

### Mac Pro 8-core

3.0GHz 8-core Xeon/FirePro D700

### Mac Pro Quad-core

3.7GHz quad-core Xeon/FirePro D300

### MacBook Pro 15in Late 2013

2.3GHz quad-core i7/GT 750M

Shorter bar = better performance



# POWER PLAY

Everyone knows why the iPad outsold the PC market: it's more fun. If an iPad had the same processing power as a laptop, PCs would *really* be in trouble. Oh, look! Here's the iPad Air 2.

The announcement of a new iPad has become simultaneously exciting and boring. It's a screen with a camera on each side. It just works. What more is there to say? Well, we can confirm that if you already have an iPad Air, there's no reason to look at it with sudden disdain and start eyeing eBay. At the same time, the new version moves the Apple tablet forward in a number of very welcome ways.

First of all, *naturally*, it's thinner. But a *lot* thinner. At 6.1mm, thinner than the thinnest iPhone. It's also a bit lighter, with the Wi-Fi model

down to 437g from 469. For a device with such a large surface area, those dimensions seem almost flimsy – but that's not how it feels. This is a gorgeously solid piece of kit, still reassuringly hefty without taxing your arm too much. And although it's a shame not to see the glass curve at the edges like the iPhone 6's, retaining the chamfered design somehow makes the iPad feel more rigid.

Like the iPhone, the iPad Air 2 is available in a Gold finish as well as Silver or Space Grey. The gold (achieved by treating the same alu-

minium with a different anodisation process) is subtler than you might think; like Space Grey, it changes with the light. We've heard more than one person refer to it as 'Champagne', which gives you an idea how it looks. A statement, yes; tacky, no.

The other change to the hardware is the addition of Touch ID, Apple's fingerprint sensor. This works the same way as on the iPhone 6: after pressing the Home button while your iPad is idle, just leave your finger on it for a second to unlock the device without entering a passcode. It also serves (optionally) to authorise payments from iTunes and in apps. We compared Touch ID on our iPad Air 2 and iPhone 6; both worked at exactly the same speed, faster than the 5s.

Finally, the Wi-Fi + Cellular edition of the iPad Air 2 – the one that can







## iPad Air 2

	Wi-Fi	Wi-Fi + Cellular
16GB	<b>£399</b>	<b>£499</b>
64GB	<b>£479</b>	<b>£579</b>
128GB	<b>£559</b>	<b>£659</b>

9.7in 2048 × 1536 Retina display  
A8X processor with M8  
8 megapixel iSight camera  
Touch ID fingerprint sensor  
802.11ac wifi, Bluetooth 4.0  
FaceTime HD camera (1.2MP/720p)  
Stereo speakers, dual microphones  
Headphone mini-jack

240 × 169.5 × 6.1 mm  
437g (Cellular 444g)

Silver or Gold and white  
Space Grey and black



## iPad mini 3

	Wi-Fi	Wi-Fi + Cellular
16GB	<b>£319</b>	<b>£419</b>
64GB	<b>£399</b>	<b>£499</b>
128GB	<b>£479</b>	<b>£579</b>

7.9in 2048 × 1536 Retina display  
A7 processor with M7  
5 megapixel iSight camera  
Touch ID fingerprint sensor  
802.11n wifi, Bluetooth 4.0  
FaceTime HD camera (1.2MP/720p)  
Stereo speakers, dual microphones  
Headphone mini-jack

200 × 134.7 × 7.5 mm  
331g (Cellular 341g)

Silver or Gold and white  
Space Grey and black

All Wi-Fi + Cellular models have GPS. Wi-Fi models also support Location Services and Maps, including turn-by-turn navigation, but rely on wifi network databases for positioning and will not always be accurate, especially beyond dense urban areas. Some apps, including games and fitness trackers, may not be compatible with iPad mini due to its older processor and lack of M-series motion coprocessor.

## iPad Air

	Wi-Fi	Wi-Fi + Cellular
16GB	<b>£319</b>	<b>£419</b>
32GB	<b>£359</b>	<b>£459</b>

9.7in 2048 × 1536 Retina display  
5 megapixel iSight camera  
802.11n wifi, Bluetooth 4.0  
A7 processor with M7

240 × 169.5 × 7.5 mm  
469g (Cellular 478g)  
Silver and white, Space Grey and black

## iPad mini 2

	Wi-Fi	Wi-Fi + Cellular
16GB	<b>£239</b>	<b>£339</b>
32GB	<b>£279</b>	<b>£379</b>

7.9in 2048 × 1536 Retina display  
5 megapixel iSight camera  
802.11n wifi, Bluetooth 4.0  
A7 processor with M7

200 × 134.7 × 7.5 mm  
331g (Cellular 341g)  
Silver and white, Space Grey and black

## iPad mini

	Wi-Fi	Wi-Fi + Cellular
16GB	<b>£199</b>	<b>£299</b>

7.9in 1024 × 768 display  
5 megapixel iSight camera  
802.11n wifi, Bluetooth 4.0  
A5 processor

200 × 134.7 × 7.2 mm  
308g (Cellular 312g)  
Silver and white, Space Grey and black



### ↑ Disappearing trick

How much thinner has the iPad got in less than five years of development? The iPad Air 2 is now 6.1mm thick. The original iPad was 13mm. So Apple has more than halved that measurement. (Also shown above are the iPad 2, no longer sold, and iPad Air.) At 240 × 169.5mm, the surface area of the tablet is also 13.5% smaller than the original 243 × 190, even though the screen has stayed the same size. Finally, the weight has come down from 730g (for the Cellular model) to 444g (under 1lb), a 64% reduction. Holding your iPad is much less ache-inducing these days. The mini, though thicker, is significantly lighter again, and more suitable if you'll commonly hold the iPad in one hand.

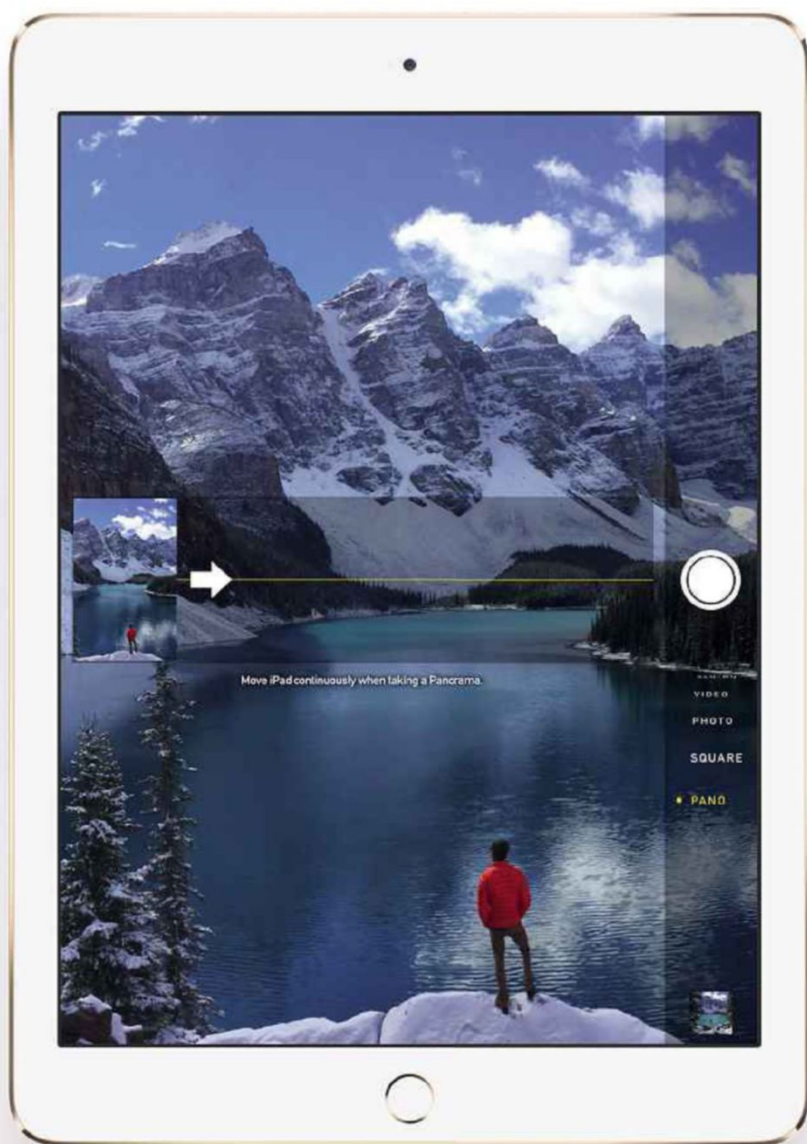
iPads  
shown  
at actual  
size

connect to 3G/4G data with a network tariff, though it doesn't support mobile phone calls or SMS – comes with an Apple SIM installed. This lets you get online straight away if the list of supported providers, which you're shown during setup, includes the one you want. If not, just pop it out and insert your own.

At the time of writing, only EE is listed in the UK. This whole concept is a ploy by Apple to wrest control from the carriers, so it remains to be seen how many go along with it. Intriguingly, once we'd exhausted our initial EE data allowance, it kept on connecting us without charging us. We're not quite sure whether to be pleased or concerned about this.

Incidentally, no, you can't transfer the pay-as-you-go SIM to an iPhone, and yes, we did try it.





Only Cellular models have this white or black aerial strip

#### ← Camera shy

How you feel about holding up a full-size iPad to take a photo or video is up to you. But with the iPad Air 2, it's totally worth it. The 8 megapixel camera doesn't quite have all the bells and whistles of the iPhone 6 Plus, but it's comparable to the part in the iPhone 5s and a major improvement on the 5 megapixel version in previous iPads. It's not so much the pixel count that makes the difference as the sensor's ability to capture more light more accurately, particularly important when you're not in brilliant sunshine. Video benefits from a 120fps (4×) slow motion mode in addition to the time-lapse feature that iOS 8 brings to all devices, and for stills there's a burst mode to capture several pictures quickly as well as higher-resolution panoramas. The huge screen may be a bit unwieldy, but it does make framing and focusing a doddle.

#### ← Screen test

Like the 5K iMac, the iPad Air 2 has a new type of panel with the LCD laminated to the glass. This makes it more inflexible, which helps the iPad's overall rigidity, and brings the image nearer the surface for an even more convincing sense that you're really touching what's displayed. Apple's claim of higher contrast and richer colour is borne out when you see the screen; subjectively, we'd rate it even higher than the iPhone 6. Reflections have been reduced, too – in fact, Apple reckons the Air 2 is less reflective than any other tablet. Again, seeing is believing. The glass of previous iPads, with the display off, acts like a black mirror – you can literally see your face in it. With this one, you get a purple-tinged low-contrast silhouette. In use, it's definitely less distracting. This all serves to show up the poor iPad mini: even the Retina models have a smaller colour gamut and look duller.

**THE BIGGEST INNOVATION** in the iPad Air 2 is buried deeper. Somewhere inside – all right, about half-way down on the right-hand edge, in that spot that keeps getting warm when you play games – is the A8X, Apple's first triple-core processor.

Two cores basically means there's one CPU to keep background processes going while another runs the app you're using. Three cores means app developers have two full-time cores to play with, and it's up to them how to exploit them for the greatest benefit to features and performance.

During the iPad launch, Apple invited up the developers of a video editing app called Replay that offers a range of instant special effects made possible precisely by this increased processing power. Others are also catching on. Pixelmator (see p108)

is a highly capable iOS version of the popular Mac image editing app that's 'optimised for iPad Air 2'.

Safari is one app that should show off the A8X's capability straight away, and sure enough, using it to run the SunSpider web benchmark demonstrates just how far ahead of other mobile processors Apple has pushed this 'system on a chip'. We'll quote Anandtech's results, since they had more devices lying around to test than we did (we repeated some of the benchmarks ourselves and got closely matching results).

The iPad Air 2 ran SunSpider 1.0.2 in 284.5 milliseconds. That compares to 336.8ms for the already quick iPhone 6, with its A8 (minus the 'X'); 389.9ms for last year's iPad Air; and 533.3ms for the fastest non-Apple tablet Anandtech could find, the

NVIDIA Shield Tablet. Samsung's new Galaxy Note 4 took 803.2ms, making the Air 2 almost three times faster.

Can any tablet beat the Air 2? It depends what you call a tablet. A popular quick test of general performance across platforms is Geekbench 3. According to the published averages of users who've run it at the time of going to press, the iPad Air 2 scores around 4500 points on this test in its multi-core mode. That's way ahead of the iPhone 6, at under 3000; it's a much closer race in single-core tasks, at about 1800 vs 1600, illustrating the importance of that third core.

Again, the NVIDIA and Samsung tablets fall behind. But Microsoft's Surface Pro 3, with some results topping 5500, edges ahead.

The Surface Pro, though, is more like a MacBook Air with a detachable

## Inside the Air 2

### → Shots fired

The 8 megapixel  $f/2.4$  camera in the Air 2 finally brings iPad photography into the 'no compromise' bracket. It doesn't quite match the capability of the iPhone 6 or 6 Plus, offering 120 rather than 240fps slow motion and lacking optical image stabilisation, but it's comparable to the iPhone 5s camera that everyone was very pleased with last year. And unlike the camera in the 6 series, it doesn't stick out of the back of the case.



### ↑ Long player

Over its various iterations, the iPad has got thinner and lighter and quadrupled the number of pixels it displays. By rights, the ten-hour battery life proudly claimed by 2010's half-inch-thick slab should now be more like ten minutes. But miraculously, the original time between charges has been preserved. Increased power efficiency in Apple's 'system on a chip' processors, which it designs itself incorporating technologies from chip manufacturers including the UK's ARM and Imagination, takes much of the credit.

Not surprisingly, almost all of the space inside any iPad is full of battery, a rubbery tea-tray of lithium ion cells that looks and feels disconcertingly like a package of plastic explosive. As it happens, lithium ion cells actually do tend to explode, or at least catch fire, if damaged or faulty – one reason to avoid plugging your iPad into cheap generic mains chargers. (Apple provides a certified one in the box.)

Eventually any battery will wear out, indicated by an accelerating decline in the time between charges, and you'll then need to take the iPad in for servicing. Opening the device and prising out the battery, which is glued in place, is a fiddly and cock-up-prone job that's best done by someone who isn't you. Apple charges a flat fee of £75 for this, but it's free if the battery gives up within your one-year manufacturer's warranty.

Beyond this, neither the EU's minimum two-year warranty period nor the Sale of Goods Act automatically entitle you to a free replacement, since the battery is a consumable part that's not expected to last the whole life of the device. But it would be unusual for it to fail within a couple of years; if ours did, we'd aim to make awkward noises at our Apple Store Genius Bar repair appointment about batteries normally lasting longer than this until the staff took pity on us and quietly replaced it for free.

### ↑ Sound thinking

Like hundreds of other components, the iPad's speakers are specially designed to fit, giving the best performance Apple could cram into the space. You don't get much of a sense of stereo, since they're right next to each other, a decision we wish Apple would revisit; one at each end would make a lot more sense, given that most games are played in landscape mode, and for others the result would be no worse than at present. As it stands, the iPad is no boom box, but for spoken word audio and TV watching you get acceptably rich and loud audio. Where sound quality and stereo matter, whether to appreciate the nuances of music or detect from which direction your enemies are creeping up on you, it makes more sense to connect some headphones, either via the standard mini-jack or Bluetooth. Unlike Macs, iPads still don't support the aptX codec for higher-quality wireless audio, although various makers offer plug-in transmitters to enable it.





#### ↓ Eighth wonder

The A8X 'system on a chip' makes the iPad Air 2 the fastest tablet you can buy, not counting Microsoft's £1,000+ laptop-with-the-keyboard-ripped-off Surface Pro 3

#### ← Single vision

The LCD panel is now one unit with everything fused together. This helps the screen to look amazing, but expect an even more eye-popping bill if you crack the glass

#### ↑ Strike one

The Lightning port is mounted on an offshoot of the main logic board. Damage it and you're going to have to replace the whole board; including parts and labour, that's likely to add up to an ARM and a leg. This is partly why iFixit gives the iPad Air 2 a reparability rating of two out of 10.

#### ⌘ Do you know who I am?

Having registered one Touch ID fingerprint during setup, go to Settings > Touch ID & Passcode > Add a Fingerprint to add more, so you don't have to pick up your iPad the same way every time. They can include other people's.



keyboard than an iPad. It has a 12-inch screen, weighs 800g, and costs over £1,000 with the CPU options that give this performance. If we're going to compare the iPad Air 2 with that, why not a full-blown laptop PC?

And in fact, a basic laptop with an Intel i5 CPU will return benchmark results in the same area. That's not surprising when you consider that the A8X's three billion transistors give it a comparable scale to Intel's Core processors. The iPad is now truly a laptop-equivalent – and unlike most laptops, it's designed to do justice to incredible high-resolution 3D graphics.

Apple says the A8X's graphics performance improves on the A7, used in every other recent iPad, by 250%. The GPU built into it (according to chip people who've figured this out; Apple doesn't specify) is from

the British company Imagination: the PowerVR GX6650 has six clusters, compared to the four in the A8's GX6450, which suggests a 50% performance increase over the iPhone 6.

The iPad also has around 50% more pixels, so some of the effort will be expended there, but as we've seen with the Retina iMac, increasing the resolution doesn't tax modern GPUs as much as you might expect. This is a phenomenal level of processing power for a mobile device.

Not surprisingly, the iPad Air 2 feels extremely smooth and responsive in general use – but then so did its predecessor. It's up to the next generation of apps to show us the quantum leap. But with its improved screen and camera, reduced bulk and fingerprint sensor, the iPad Air 2 has enough tangible advantages to make

it a very attractive buy – and still at a highly competitive price.

**THE IPAD MINI** has also been upgraded, but only to add Touch ID and the Gold case option. Nothing else has changed, and its predecessor, now on sale at £80 less, looks the better bargain. Both are comfortably light.

Note that the mini's screen, although Retina, has a limited gamut. While the Air 2 (and its full-size Retina predecessors) can essentially display the whole sRGB space, the mini covers only about 63%. Colour is accurate as far as it goes, but the screen looks dull next to the Airs.

The original iPad mini, with its non-Retina display, also remains on sale. At £199 it's tempting, but its A5 processor, nine times slower than the Air 2, makes it a questionable investment.

# Top 10

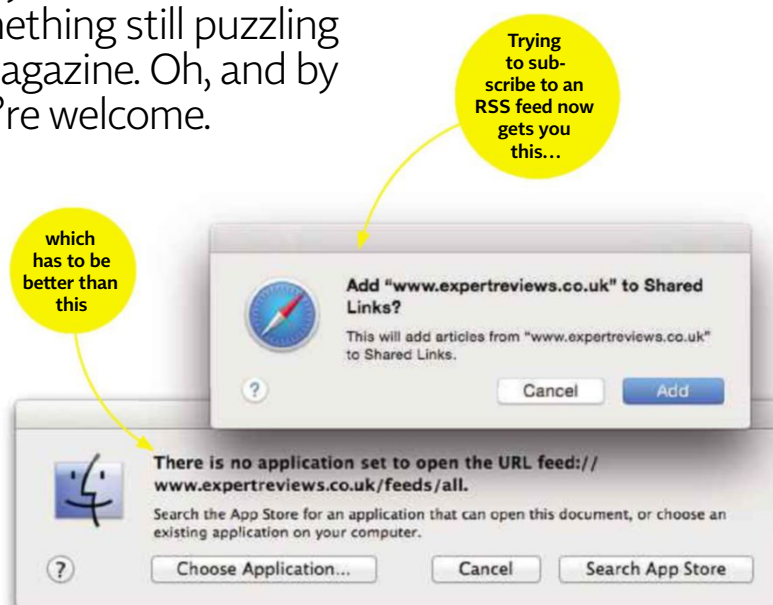
You know what's new in OS X 10.10 Yosemite because we've been previewing it for months. But it's the little things that throw you when they change. Here's a roundup of wrinkles from our first hour with the new system. Found some of your own, or is something still puzzling you? Tweet us @macusermagazine. Oh, and by the way: yo-SEM-a-tee. You're welcome.

## Feed me

RSS is back! Many moons ago, Safari had built-in support for news feeds, so when you went to a site that offered one, you could subscribe to it, and Safari would maintain a list of feeds that you could click to read what had come in. Then this was stripped out, and you had to add a third-party RSS reader if you wanted that.

Now Safari can handle feeds again. Click a link offering you one, often found on blogs and news sites, and Safari will ask you to confirm you want to add it to your Shared Links. Uh-oh. Shared Links is a feature available in the left-hand sidebar (which you show and hide via the icon next to the back and forward buttons) along with your bookmarks and Reading List.

But if you use Twitter, for example, the point of Shared Links is that it lists every tweet containing a link in your timeline. This means it's a constantly scrolling hot mess, into which the RSS feed is now dumped – not ideal (see opposite, far right). As with several other Yosemite features, we'll have to see how this pans out.

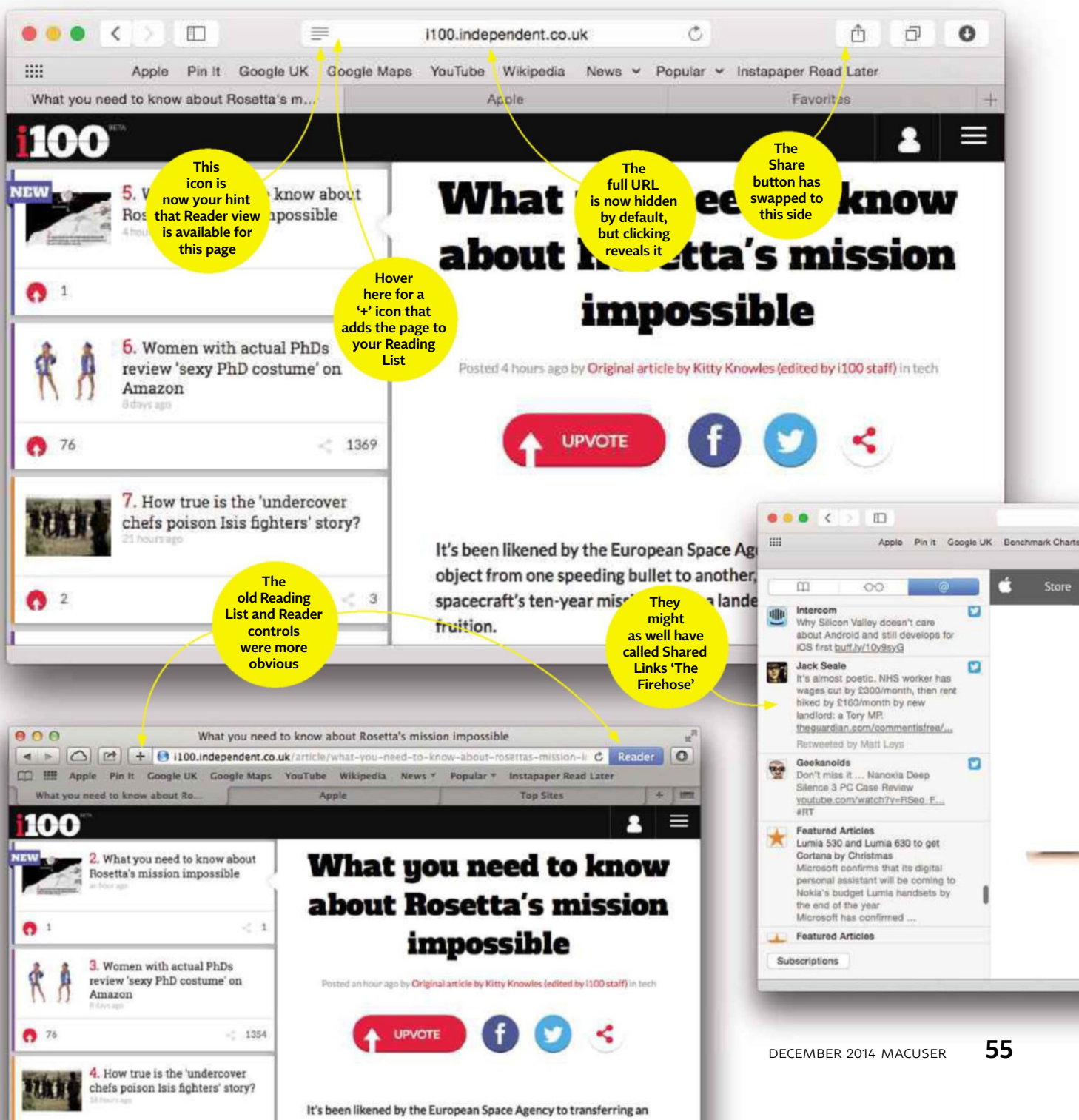




# Safari

It's increasingly clear that Apple believes a web browser should have as little user interface as possible, and if it can hide what's left, so much the better. Safari is a paragon of OS X 10.10's stripped-down feel. There's no window title bar any more, so you need to get used to looking for the title of the web page you're looking at in the tab title instead. The unified URL/search field, back and forward arrows and other action icons are now level with the Close, Minimise and Maximise traffic light buttons. You'll notice that the address field no longer shows the full URL, just the domain; you can revert this in Safari > Preferences > Advanced. Preference changes update the window instantly, so you can preview the options you're picking. There's no Favorites bar by default, but it's still on the View menu waiting for you to bring it back, as we've done here.

What you can't change is that both the URL and the Favorites in the Favorites bar centre themselves. It's particularly distracting when the URL jumps from the left, where you type it, to the centre as the page loads, and it's annoying that the position of your favourite Favorites in relation to the other controls changes arbitrarily depending on the window size, so you can't memorise where things are. This happens in other areas of the Yosemite UI too, and seems counterproductive. What's wrong with ranging everything left? It's especially ironic that this has been introduced at the same time as Helvetica. You wouldn't catch a Swiss-influenced designer running around centring everything.





## iTunes 12

This isn't strictly a Yosemite feature, because you can upgrade to the new iTunes even if you're still on Mavericks. Or Mountain Lion. Or Lion. But iTunes 12 will only get its full new interface design in Yosemite, with its Helvetica typography and flat window furniture. Below we compare iTunes 11, iTunes 12 on Mavericks, and iTunes 12 on Yosemite, and point out some of the changes.

All your media types are now over here, some inside this pop-up

This appears when a download is in progress

Change the sorting of items here

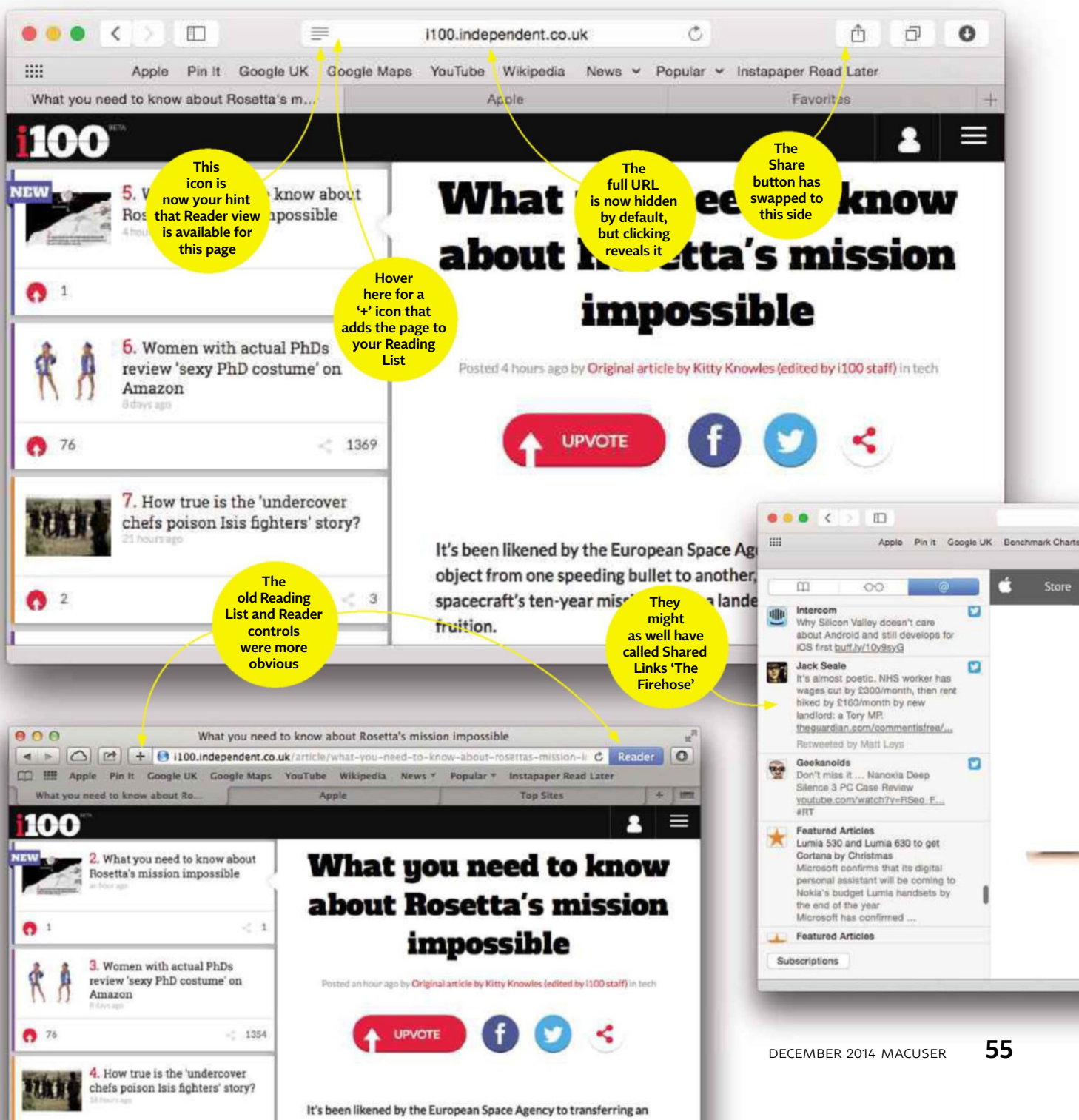




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### Drop intro

Apple's Markup is the first example of Extensions, which allow developers to add tools to each other's apps. Activated from System Preferences > Extensions > Actions, it adds a button to PDF and image attachments that launches a rudimentary graphics program with which you can add annotations. Future Extensions could be more interesting than this, frankly.

More useful every day is Mail Drop, which routes large attachments via Apple's servers. We tried sending a 48MB Photoshop file, twice iCloud's limit, and it just went; when we received it, the message header warned us the full-resolution image would only be available for a month, but opening the attachment worked just like usual. Recipients on Windows get a slightly less seamless WeTransfer-style link to your attached file. It seems a neat way to deal with the issue.

Come on, who writes yellow messages pointing to things?

### A little more conversation

Yosemite brings no improvement to the Messages app's half-hearted support for third-party instant messaging systems; alternatives like Adium make more sense if your friends are on a multiplicity of services. But it's great that the Continuity technology under the hood now enables SMS texts via your iPhone to appear along with your iMessages.

The first time we opened Messages, it knew (via our Apple ID, of course) about our iPhone and offered to set this up. Enter the supplied code on your iPhone to pair it, and it's done.

Whether the facility to send texts as snippets of audio is useful to you will depend on your social habits. It seems weird to effectively revive the lost art of leaving voicemail, especially when you look back through a conversation, which appears in bubbles like texts, and all you can see is waveforms. But who knows, it could catch on. It does avoid having to stop what you're doing to type, and saves interrupting busy people in real time, since they're not obliged to talk back. The group chat management features will definitely be of use to those who habitually hang out in long-running group chats.

Pair OS X with your iPhone, and green bubbles (for SMS) will start appearing right here too



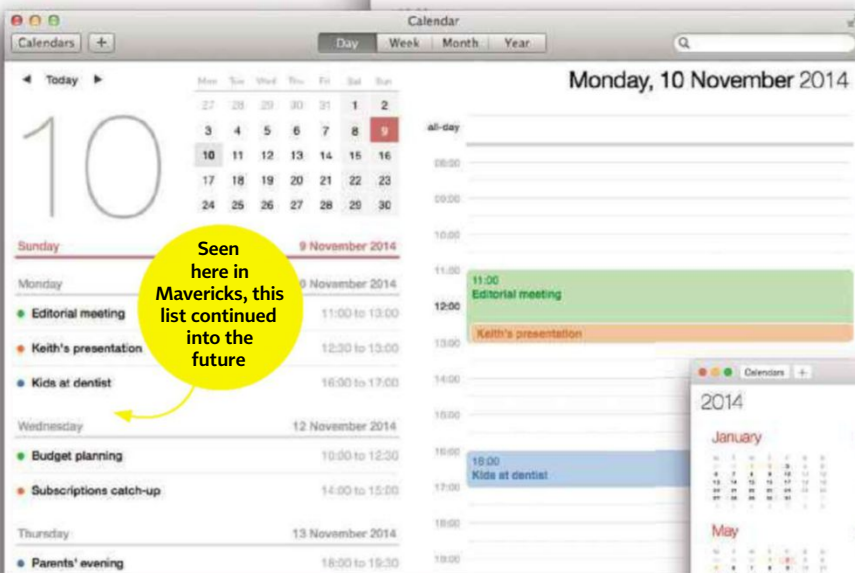
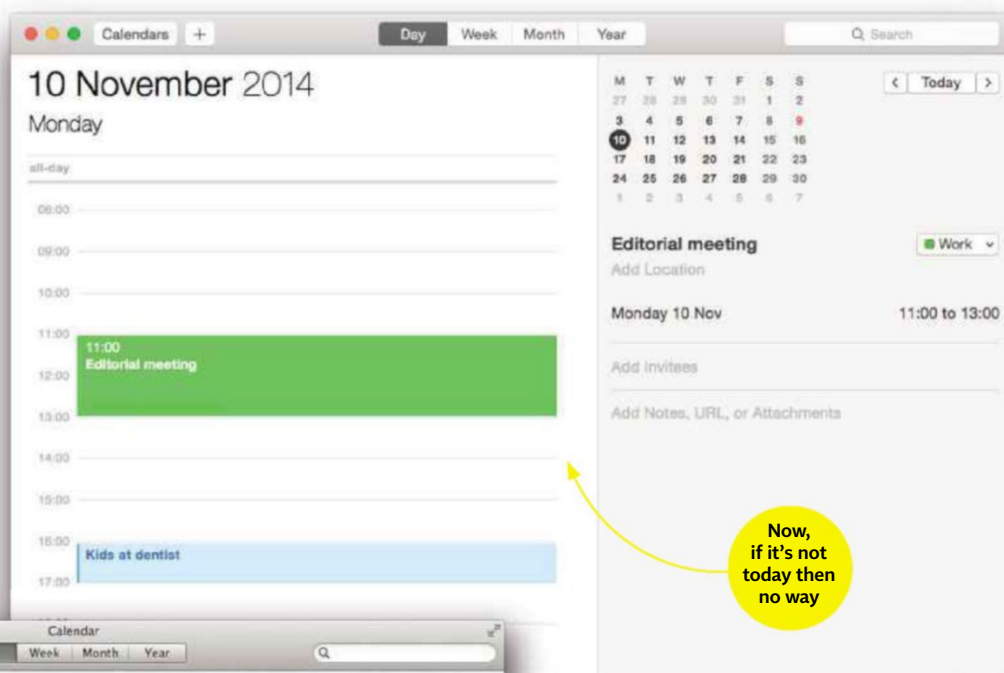
### Private dancer

Returning to Safari, it's worth pointing out how Private Browsing now works, because it's not obvious. Rather than having an option to put the whole app into Private mode, the only way to initiate a private browsing session (meaning that your web history and other data is not recorded on your Mac; it doesn't stop you being identified or tracked by the sites you visit) is to use File > New Private Window (Cmd+Shift+N). This makes a window in which all the tabs will be private, indicated by a dark menu bar. Other open windows will not. You can't switch the window back to not-private, and nor is there a quick way to open a new window at the same URL, which can be annoying when you realise you're in Private mode accidentally.



## Tell me more

Minimalism is all very well, but we can't help feeling the uncluttered look of Calendar in Yosemite is at the expense of information. The Today view still has two panes, but they're much more focused on showing what's happening just today; if that's nothing, the space no longer gets used to show events scheduled for a little later. The same goes for the Calendar slot in the Today view of Notification Center, which dumbly shows a 'No Events' placeholder rather than promote some upcoming events further ahead.



## Year walk

One bit of functionality you can retrieve is showing events as a 'heat map' in the Year view. To activate this, tick Calendar > Preferences > Advanced > Show events in year view. Without it, there's little point in this view at all.

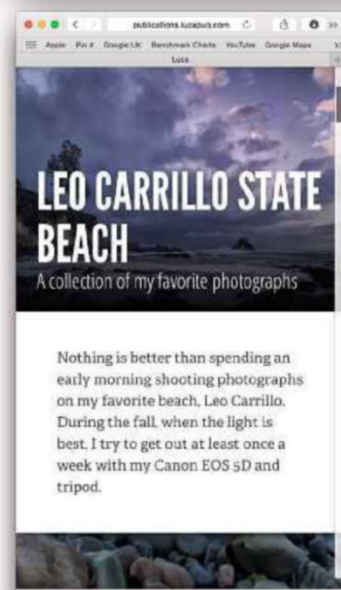
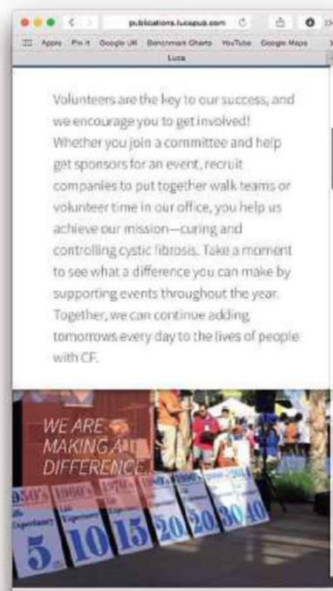


## Inspect a gadget

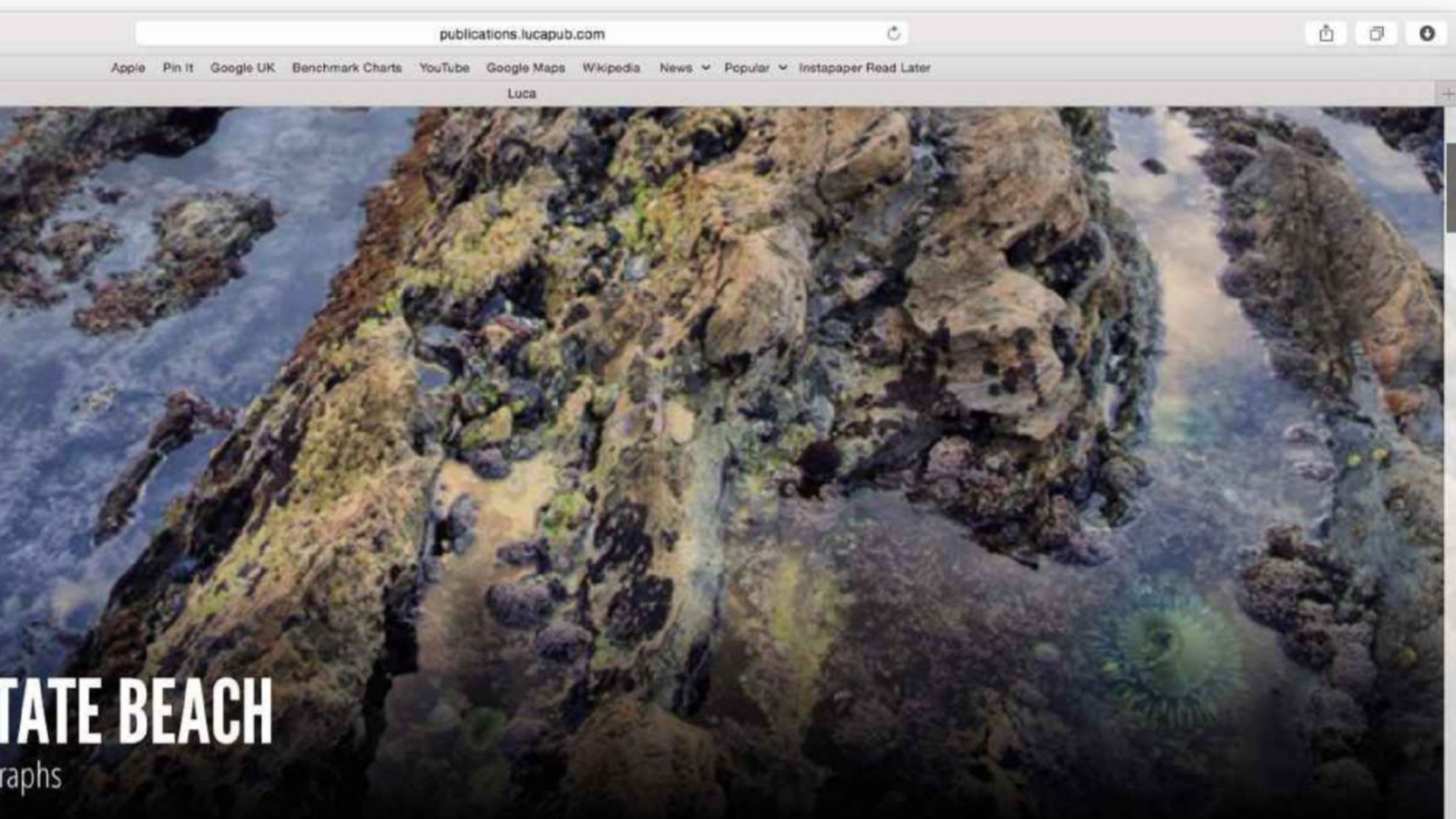
Dashboard, the second screen you can flip to by pressing its dedicated function key to access useful widgets such as calculators and currency converters, still exists in OS X 10.10, but it's effectively been superseded by the introduction of widgets in the Notification Center, as in iOS. The Notification Center slides into view at the right of the screen when you click the rightmost menu bar icon. At its foot, click the button marked 'Edit' (or something else inviting you to interact) to slide it further over and reveal a set of widgets at the right. Click '+' beside any of these to add it to your column of notifications, where it can be used in place. When third-party apps offer widgets, they'll appear here, like Continuity Keypad on our screen (left).



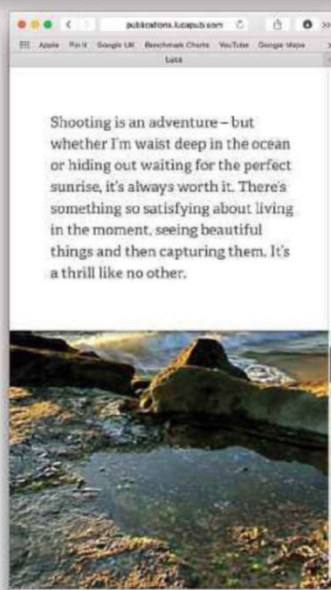
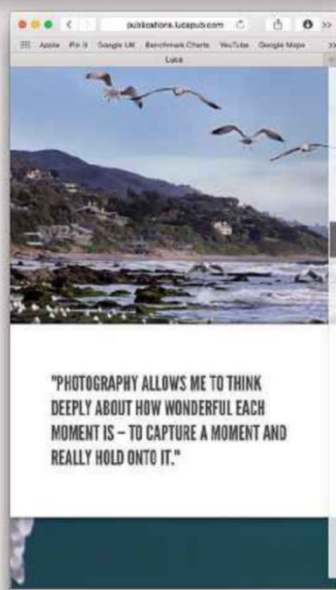
**Project Luca** is the latest experiment from Adobe's skunkworks to make it into real life, or at least invitation-only beta. It's a new way of creating 'stories' on your iPad for readers to view on whatever device they choose, using responsive design to fit your content to their screen. Sign up at [getluca.com](http://getluca.com) to receive new code builds as they arrive (none had arrived with us yet at the time of writing) via TestFlight, the iOS app recently acquired by Apple that lets you try approved beta test software before it's ready for the App Store. Something else Apple has recently acquired is PRSS, a digital magazine platform. It's good to see these tech leaders looking to the future of editorial content creation, but we hope to see new paradigms that are ready for publishing as an industry, not just a pastime.







Nothing is better than spending an early morning shooting photographs on my favorite beach, Leo Trillo. During the fall, when the light is best, I try to get out at least once a week with my Canon 5D and tripod.



#### ← Transitional phase

Luca stories shape themselves to fit the reader's viewport and progress with parallax motion, zooms and fades as they scroll down



[PROFILE]

**JAMES FRYER**

ILLUSTRATOR

I enjoyed drawing from a very early age. I had many favourite subjects at school, but art and design was always at the top. During my art A Level course, I was enlightened to the numerous avenues open to me in this field. I decided to go into further education and did a National Diploma course in Boscombe, Bournemouth in graphic design. It was during these two years that I realised I wanted to go into illustration.

THERE WAS ONE project on this course that stood out for me. It was simply called 'idea generation', and it has formed the basis of every project or commission I've done since.

We had to choose an object and come up with as many ideas, concepts and visuals for this object as we could. It taught me to have the confidence to put anything and everything down in my ideas, no matter how absurd they seemed. I've never had so much fun on a project, and have never learnt so much about letting go with your creative imagination and not worrying about what others will think of it.

We were also encouraged to collect clippings and examples of graphic design, photography and illustration that we liked. I was amazed by illustrators such as Jamel Akib, Paul Slater, Rafał Olbiński, Dave Cutler, James Marsh and Brad Holland, to name but a few. I was hooked.

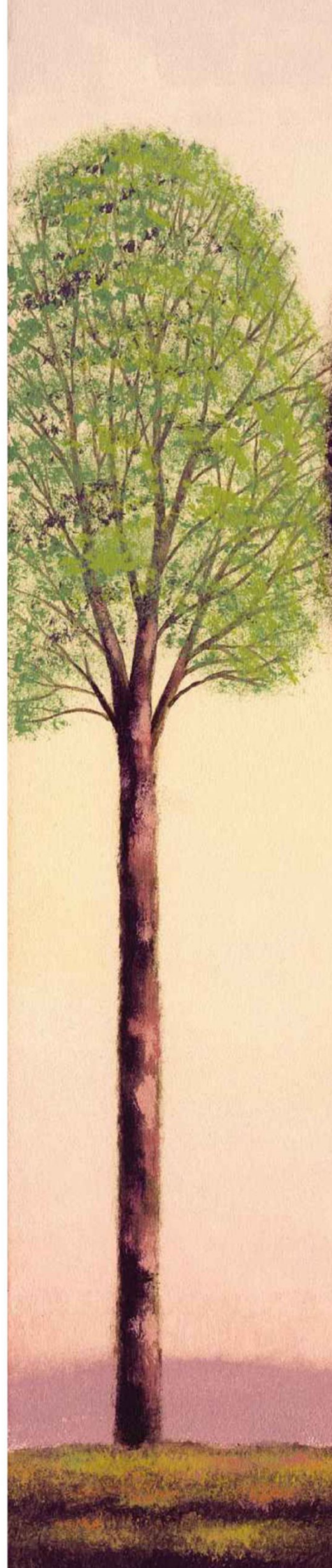
I went on to Plymouth University to sharpen my skills and to get my degree in illustration.

AFTER UNIVERSITY, I was contacted by an illustration agency who had seen my work. They took me on and immediately got me some very big jobs. It was a good time, but the recession came and everyone was hit hard. I then had to basically start over on my own as a fully freelance illustrator. That was back in 2000, so I spent a lot of time walking around with my portfolio. The internet has made it all so much easier now, but I do miss the face-to-face meetings with clients.

SLOWLY BUT SURELY, I began to get regular clients, and I haven't looked back. There have been ups and downs, but I've been fortunate to always have a steady influx of work.

Illustration is like the fashion industry in that styles come and go, but luckily the style I adopted is universally understood and liked. It has changed over the years, and I like to think my illustrations have only got better with regards to composition, colours, ideas and so on.

IMAGES JAMES FRYER













IMAGES JAMES FRYER



#### Previous spread

'Extended Business Travel'. Client: The Society of Human Resource Management HR magazine. Brief: what HR departments can do for people who have to travel a lot due to their work

#### Opposite 'Dictatorship?'

Self-initiated piece. Brief: In taking on the role as the world's sheriff, is the US in fact becoming a dictatorship itself?

#### This page 'Terror'. Client:

Times Higher Education magazine. Brief: a personal story of terror on a plane when the man sitting next to a passenger told him he had a bomb on board

My work is still conceptual and atmospheric, but I think it's a lot more colourful now: more thought goes into the palette of each piece.

A TYPICAL JOB for me involves getting an email from the client, accepting the commission if everything is agreeable (which can mean a bit of negotiating) and proceeding onto the ideas. I'll do many different concepts for each job, as many as the client wants or needs – usually five or six are enough. I'll research the brief, look at keywords, headlines and so on, and try to come up with something that is not only clever, but also visually stimulating. Once an idea is chosen, we'll discuss colours, composition and small details.

Then I go straight onto the final painting. I cut my board to the right dimensions and then prime it with gesso. The gesso helps the paint attach to the board. If you don't prime it, the paint slips everywhere. So I gesso, then I rough up the gesso with

the end of a large paintbrush to create a rough texture. I sand this rough texture so that it's smoother, but I keep a little of that texture, which again helps the paint stick.

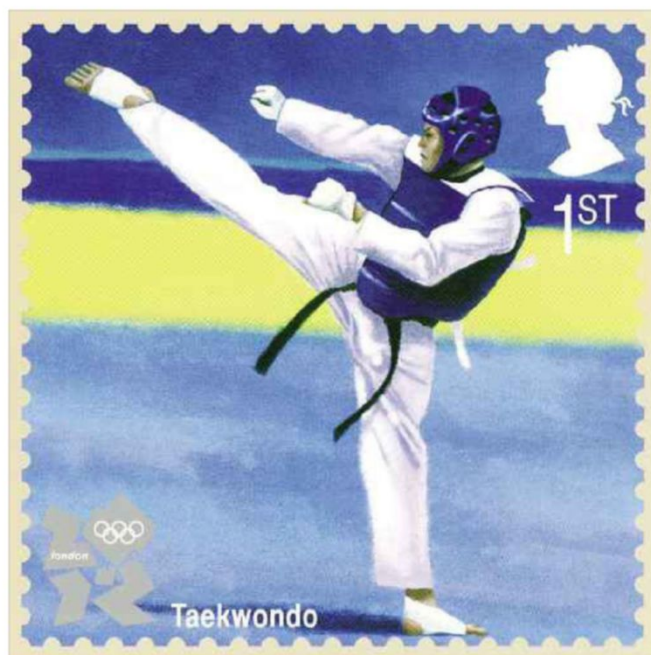
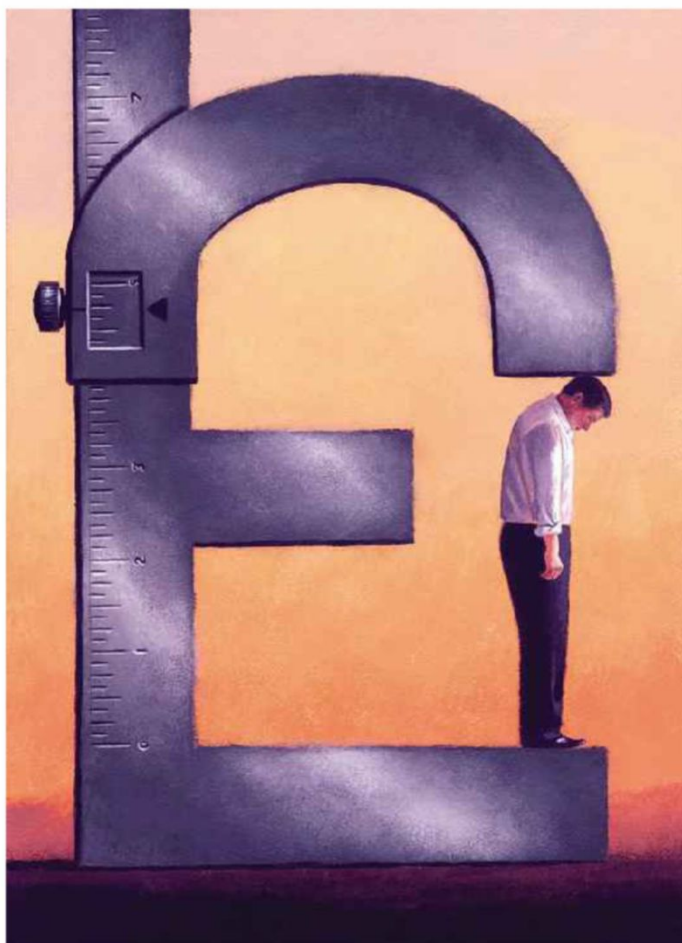
Once I have my white, gessoed board, I apply a warm colour to the surface. I find that having a warm, neutral colour helps me to properly see the other colours I apply. If I paint just on white, I find that the harsh contrast hinders my judgement. The warm undercoat also helps to knit the whole illustration together, as I allow some of it to come through.

I then like to draw directly onto the board when possible. Drawing directly on the board gives a more natural, spontaneous image. It also gives the image movement. I used to draw the image on detail paper first and then transfer to board, but I found these images could look a bit static. I do still have to do this on more complex pieces that need precise drawing, but I'll draw straight onto the board whenever possible.

I then mix my colours. I'll have a good idea of how I want the whole illustration to look, and so will mix the majority of colours needed in one go. This again helps with the spontaneity of the piece. If I have to keep stopping and mixing paints, it can affect the overall look and feel of the piece. Once finished, I scan the artwork in and get it up on my Mac.

I use a lot of different equipment and materials in the process of producing an illustration. Here's a small list of things that I couldn't do without: Rotring pencil, Windsor & Newton Artists' Acrylics, hardboard, gesso, my fantastic daylight lamp, a hairdryer, a mixing pad, my scanner and my Mac.

ALTHOUGH I'M A traditional illustrator/painter, I'm not sure what I'd do without my Mac now. It has become one of the most important parts of the process for me. Once on the computer, I can clean up my illustrations. I get rid of any blemishes and alter the



IMAGES | JAMES FRYER

**This page, left** 'Payment By Results'. Client: PCS Activate magazine. Brief: how some workers are only being paid by the amount of results they produce and not by the number of hours they work

**Above** 'Taekwondo Olympic Stamp'. Client: Royal Mail. Brief: a first-class stamp for the 2012 Olympic Games to illustrate Taekwondo

**Opposite** 'The Translator'. Client: New Electronics magazine (front cover). Brief: mobile devices will soon be able to translate any language audibly

contrast, brightness and colour settings to get the optimum result. I look back at work I used to send without going through this process on the computer and the difference is staggering. Computers have taken visuals to an incredible level, and it'll only get better and better.

Some of my work now is half painted and half digital. At some point in the future, I will have a completely different style that is solely digital. I don't think painting will ever die, but I have noticed a growing trend in clients who like to be in complete control of an illustration. This means being able to change a background or colour or object with a click. Obviously, this isn't easily done with a traditional piece of art. If all of the illustration is in digital layers, an art director can change whatever they want.

I do feel, though, that some of the immediacy and vibrancy of a traditional painting or drawing is lost with too much interference from other parties and computers. Having said

that, there are some absolutely fantastic digital illustrators out there.

I'VE BEEN LUCKY enough to have had lots of really different and challenging jobs, from editorial covers with very tight deadlines to large advertising jobs where you have to please lots of different people. I've done book covers, posters, Olympic stamps, regular spots, podcasts, websites...

Some of my best and most memorable work has been with regular clients. People who use you regularly know what you can do and seem to allow you a bit more freedom. This is illustrated perfectly by my regular collaborations with editorial clients such as The Economist, Saga, What Car, Radio Times and the Financial Times.

One client that has been an absolute dream to work for is the Times Higher Education magazine. I do their opinion pieces once or twice a month. They email me the brief or article, deadline and fee and then let me get on with it. They give me a few

days, but don't worry about seeing my ideas at all: they basically want my opinion on the article, as an illustration.

I've never had the opportunity to work in this way with anyone else. I have done some of my best work for this client, including a piece that won gold in the Association of Illustrators Editorial category one year.

IT'S NOT ALL been plain sailing. Constant self-promotion, admin and invoicing, strong competition from very good, established illustrators and new and upcoming talent, recessions and fees that haven't risen in a decade provide challenges. Nevertheless, for me there is no better feeling than producing a really clever, imaginative, intriguing, beautiful illustration that I then see in print or online. It's a wonderful profession where I can be very creative and also be my own boss. I enjoy it so much that I can't see myself ever doing anything else.

**WEBSITE** jamesfryer.co.uk





# Paper craft

Lisa Hassell learns the secrets of the artists who use 2D materials to build 3D models to make 2D graphics.

PAPER CRAFT IS more than a technique – it's become a field in its own right, with illustrators, designers and self-made crafters working across media to present their unique spin on this trend. From traditional techniques like paper quilling to contemporary 3D construction, this hand-crafted look injects personality and playful fun into illustration, ad campaigns and editorial work.

The delicate art of creating intricate pieces by folding, layering and cutting paper has had something of a revival in recent years, with a growing number of designers and illustrators embracing paper craft. Here we explore the work of five paper craft designers and invite them to share their expert tips and essential tools.

**PREPARATION IS KEY** It's tempting to jump right in with the scissors, but the first step towards a paper craft illustration is to plan your design,

says freelance illustrator Ciara Phelan ([ciaraphelan.com](http://ciaraphelan.com)). 'Paper cutting is very meticulous and labour-intensive; it's important to consider composition, visual elements, colour palette and paper stock.'

Ciara, whose distinctive style combines vintage imagery with paper-cut patterns and 3D shapes into vibrant collages, works in a shared studio space in London. 'Some create a pencil sketch, others work up solutions in Illustrator. I use Photoshop to plan everything before I start cutting.'

For Swedish prop designer and paper-cut artist Fideli Sundqvist ([fidelisundqvist.com](http://fidelisundqvist.com)), creating a sketch helps to figure out how the image will be constructed. 'I do a lot of sketching, making notes and collecting reference material. Creating real characters such as people or animals is tricky in terms of capturing the right expression; the internet is great visual resource.'

## → Shadow boxing

Paper cut artwork takes a combination of lateral thinking, graphic composition, craft, lighting, photography and retouching.

'The biggest challenge is to reach the exact shape I am looking for,' says artist Fideli Sundqvist – 'and to get the object to stick together'

Russian designer Yulia Brodskaya ([artyulia.com](http://artyulia.com)), who specialises in quilling or paper filigree, starts every piece with a sketch. 'Preparation is very important, because once you've glued a piece of paper it's permanent. I need to have a very clear idea about what I'm doing from the beginning.'

A more traditional art form that has attracted a following in recent years, quilling involves strips of paper which are rolled, shaped, and glued to create decorative designs. Yulia, who's earned an international reputation for her innovative paper illustrations, gives her creations a unique twist. 'My art differs to some extent from traditional quilling because I tend to use paper strips in a more free way, as if I am drawing.'

Jack Mussett of Australian creative outfit Motherbird ([motherbird.com.au](http://motherbird.com.au)) also favours the long game. 'We start sketching in notebooks to make a loose [continued on p75]









'I try to find several keywords in the theme that provoke images in me, and visualise them.'

**Mayuko Fujino**  
planetplatonio.org

I use an NT Cutter art knife (D400) with 30-degree blades (BDC200P). Change blades often while you're working and keep them sharp!

My Olfa cutting mat (9881 RMSG) has the best hardness and lasts longest. Cemedine's double tape for acrylic material is so transparent that it wouldn't be visible even when you use very thin paper.

Arches Cover 250g paper is my favorite; it's a little too thick for paper cutouts, but holds collages well. If I'm glueing, I use Royal Coat Decoupage Finish or 3M spray glue.

When I get a commissioned piece, I exchange emails to find out the client's needs. It helps to ask if there's an image in my portfolio that's similar to what they are looking for, in addition to sending several rough pencil sketches of ideas for them to pick. I try to find several keywords in the theme given by the client that provoke images in me, and visualise them.

I make a draft first, then I tape it over the paper and cut them together. After I finish the cutting, I apply collage from its back, usually with double-sided tape, sometimes with glue.



IMAGES MAYUKO FUJINO 'I GIVE THEE ALL, I CAN NO MORE'





IMAGES CIARA PHELAN 'READING IN AUTUMN' (TOP), 'WINDOW TO THE WILD'



'Always plan before you start making. You need to consider your composition, the visual elements, the colour palette, paper stock and concept first.'

**Ciara Phelan** [ciaraphelan.com](http://ciaraphelan.com)

There are a few essential items to create a paper cut illustration. You need: a scalpel with 10a blades; double-sided tape; a self-healing cutting mat; magic tape; UHU glue; foam board; a ruler, and a pencil. They are all quite basic materials, but they allow you to be flexible in how you work with paper, which helps when dealing with different sizes and layers.

Always plan before you start making. Most people are tempted to jump right in, but you need to consider your composition, the visual elements, the colour palette, paper

stock and concept first. Paper cutting is very meticulous and labour-intensive; you want to avoid a situation where you spend six hours making an element to find you've used the wrong colours!

It's important to consider how you will capture your illustration, because the right lighting and good photography can really bring a piece to life. It's great to work with a photographer, because they can bring new ideas and explore different ways of lighting a piece to create shadow and depth.



'I feel almost like I bond with my characters. I guess it is fairly easy for me to enter my fantasy world. To make the elephant in front of me get the exact right look in his eyes can all of a sudden be very important.'

**Fideli Sundqvist** fidelisundqvist.com

I start off brainstorming in my sketchpad, making notes and drafts to start the creative flow. In this way, I get a view over the composition and I can sort out what ideas are best for this specific project. Usually I get many ideas and visions which may be used in other projects, and I return to old notes and sketches later.

After choosing one or two ideas, I use Illustrator to make sketches. It gives me a great feeling for the colour, shape and composition. I can email the sketches to the client and change whatever needs to be corrected.

Once the sketch is approved by the client, I am ready to start constructing. I sketch again, this time in paper, to figure out how I want to create the objects. It's about how detailed they will be, how three-dimensional, if I want to contrast them with a simpler background, etc.

Also, I need to research originals. If I am building something that is supposed to look like food, I go to the grocery store. If I am building a bird, I google loads of birds.

I feel almost like I bond with my characters... I guess it is fairly easy for me to enter my fantasy

world. To make the elephant in front of me get the exact right look in his eyes can all of a sudden be very important. Even though it is difficult to create 'living' characters, these are the most fun to work with. I enjoy trying to tell a story.

I also find inspiration in music. I can choose a different kind of music depending on what mood I want to be in when creating. This is a way for me to get a more direct connection between emotion and hand.

I work either in two or three dimensions. Two-dimensional paper cutting is like drawing with a





IMAGES FIDELI SUNDQVIST • CAMPAIGN FOR IBIS STYLES

scalpel. I think the paper cuts look best as originals, since they are flat. I play with shadows when I do 2D work. This technique I mostly use for my own projects that are not commercial.

Making 3D objects offers a lot of variation: how detailed I make the objects, how many there are in a picture, how the setting is built up. I can build an entire scene with space for a character, or create props or a simple scenography. Sometimes I integrate real products, as in the perfume campaign I made with Magnus Cramer (p69).

Both I and the photographer use the sketch from Illustrator. The first picture takes a great deal of time, since we need to adjust the light.

The biggest challenge is to reach the exact shape I am looking for, to create the 3D feeling, and to get the object to stick together. I have found, by learning from mistakes, that double-sided tape makes really nice seams but is not as strong as glue.

Another challenge is to pack and move the objects. Sometimes it feels like one third of my work is running around carrying clunky packaging. I am lucky it is not heavy!

‘Your client should be completely on board with the idea and approach, based on mockups or renders, before you go too far down the road.’

**Jack Mussett** motherbird.com.au

The concept is the foundation of any creative piece of communication. It cannot and should not exist without a purpose, a meaning or an idea. If you begin with the technique you’re going to use instead, it’s very difficult to post-rationalise or conceptualise half-way into a project.

When creating any paper craft piece, we make sure we have a good understanding of the general composition before we get too involved in folding, cutting, glueing and shaping. A considerable amount of effort goes into the craft side of it, so we like to ensure we have positive feedback from the client before we begin the hands-on work. Your client should be completely on board with the idea and approach before you go too far down the road. We always seek to have our visual mockups approved at an early stage; this might be based on sketched mockups, very quick paper folds or vector renders.

While stylistic choices are often aesthetically based, it’s important to ensure the concept is reinforced and any visual elements have a clear purpose. There’s nothing worse than graphic for graphic’s sake.

Once we have a clear strategy, approach and conceptual, we’ll begin to consider execution techniques. If we take the paper craft approach, we’ll often start sketching in notebooks until we have a loose composition, which we then move to render roughly in Illustrator. This allows us to create lots of different outcomes and refine the form and colour before we get too involved in the production.

The start of any paper craft project is the paper. You’ll also need a good-quality scalpel, a cutting mat and strong double-sided tape. At the end, Photoshop is essential, even if it’s only for a slight tidy-up.

The biggest challenge with paper craft is the time and effort that goes into developing the skills to create a memorable and unique piece. Learning this from scratch for us became a trial and error process where we figured out what was and wasn’t possible with the resources we have. We’ll often push our comfort zones by composing a piece by hand or on computer not really knowing whether it’s possible or not. This is a great way to learn new skills and understand where the boundaries truly lie. Also see p4

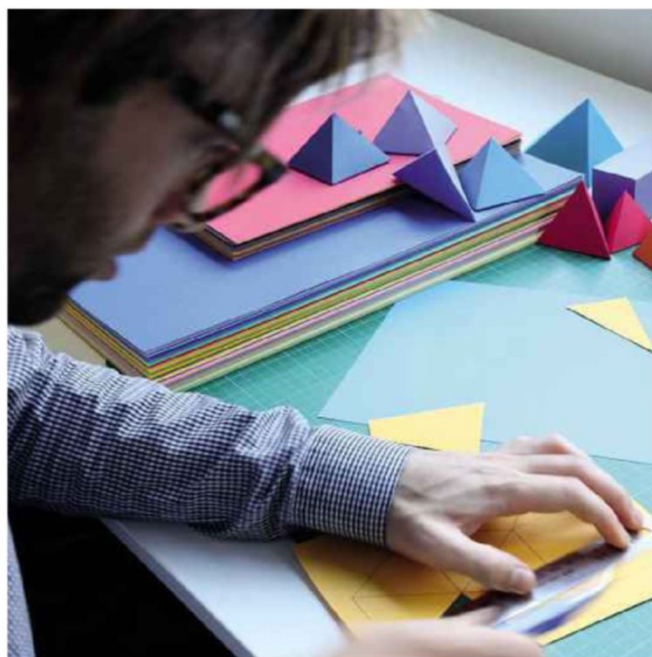


IMAGE COURTESY OF JACK MUSSETT



IMAGE YULIA BRODSKAYA 'CANDY CRUSH', 'SHOPPING ONLINE' (OPPOSITE)

'Sketching is a very important stage, because once I glue a piece of paper I can't remove it – the glue is very strong! So there is no place for errors. But there is always room for experiments.'

**Yulia Brodskaya** [artyulia.com](http://artyulia.com)

I started to practise art in various forms from a very early age. I went to art school for 10 years, then did two degrees in graphic design (one in Russia, another in the UK), finishing with an MA in Graphic Communication. After graduation I spent two years looking for my own style, and then I discovered paper quilling.

I wanted to create a small brochure with my hand-drawn illustrations to send out to clients, and I was looking for an eye-catching image with my name, Yulia, for the cover. I created a number of hand-drawn variants, but I didn't like any of them. Then I remembered an image of edge-glued strips of paper that I'd seen years ago at Moscow University. So the first paper artwork that I made was my name. I had no idea this little experiment would become my passion.

Quilling involves the use of paper strips that are rolled, shaped and glued together and/or to a

surface to create decorative designs. Thin paper is better for quilling basic shapes, thicker paper is more suitable for my 'freestyle' approach.

I suppose one of the main qualities that a person mastering quilling needs is patience. It is a very slow and labour-intensive process, so it can become a torture unless you can enjoy it.

I always make pencil sketches first, and don't start the paper work until they're approved by the client. Sketching is a very important stage, because once I glue a piece of paper I can't remove it – the glue is very strong!

So there is no place for errors. But there is always room for experiments with the actual paper, because sometimes it is difficult to see what will look good before starting.

The research I carry out depends on the brief. A change of scenery is always helpful for keeping one's creative battery charged, but in practice I

don't have much time for an escape – I also have two little kids. But a burst of online research can work wonders. I collect and bookmark images that I stumble on during my web searches. And of course I collect paper.

Gustav Klimt is my all-time favourite artist, influence and inspiration. I get inspired whenever I see his work. I'm most influenced by his 'Golden Phase': many of his paintings from this period used gold leaf. I always admired the decorative-ness of these works, the ultimate development of ornament and high level of intricate details that form the whole picture and make it so fascinating to look at.

One of the challenges when using a generic technique such as quilling is to find a unique style. I have managed to do that by incorporating typography, using paper strips in a free way – I always wanted to make it look more modern and cool.



[continued from p68] composition which we then render roughly in Illustrator. We always start with the idea.'

Set up in 2009 by Jack with fellow designers and close friends Chris Murphy and Dan Evans, Motherbird pride themselves on a collaborative and often experimental design process. 'We find that this approach gives us space to create lots of different outcomes and refine the form and colour before we start building.'

**PAPER CRAFTING TOOLS** Equipping yourself with the right tools will not only save you time, but also make the paper craft process more efficient and more enjoyable. The starting point is the paper. An ideal thickness for folding paper shapes is about 200gsm, reckon Motherbird. 'Any thicker and the paper becomes difficult to fold; any thinner and it often won't hold its shape.' Illustrator Fideli Sundqvist also recommends a hard cutting board, a good scalpel and supply of blades, a steel ruler, compass and spray adhesive. Both agree on the paper crafter's go-tool tool for elaborate constructions: very strong double-sided tape.

'The biggest challenge [for me] is to reach the exact shape I am looking for, to create the three-dimensional feeling – and to get the object to stick together!' Motherbird agree. 'There's nothing more frustrating than creating a series of paper shapes that keep coming unstuck.'

Double-sided tape also offers the advantage of creating 'really nice seams' – perfect for achieving a clean finish, Fideli observes. 'Since most of my objects are to be photographed, I usually work with tape – it's not as strong as glue but offers flexibility.'

**CAPTURING THE PIECE** Translating your constructions into digital presents another set of challenges, but you may already have all the equipment you need.

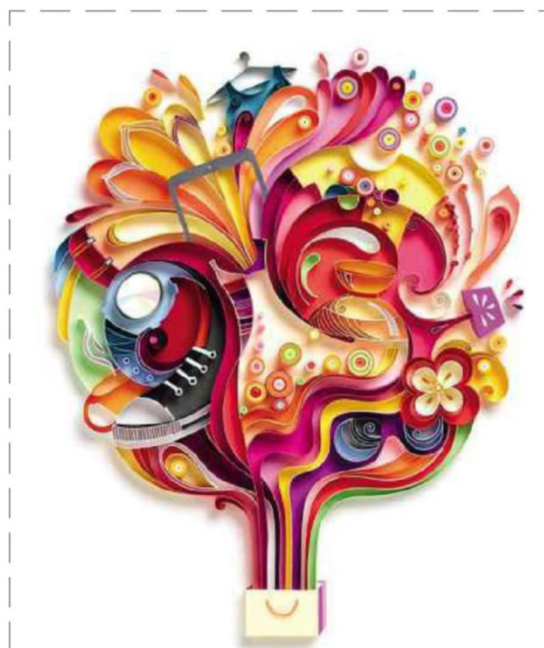
'Paper craft illustration comes into its own with photography: clever lighting, adding shadow and depth to your artwork can really bring it to life,' says Ciara Phelan. Although she frequently collaborates with photographers, doing it yourself can also work. 'Lots of artists still use natural light to shoot with. A large window and a digital SLR, and you're ready to go.'

Before setting up your piece, plan the light and consider which direction you want shadows cast. This should make it easy to get a great set of photos to pick from. Think of the camera frame as an element of the composition, not just a way of capturing it – an approach that will be familiar to anyone who's worked in 3D software.

Having got your shot, Photoshop is the next port of call to edit out any mistakes and emphasise the shadows

computer-generated image.' Others might emphasise the rough-and-ready, real qualities of paper models as a reaction against digital. Your own approach is what matters.

'The concept will usually drive the process, technique and treatment, and is something you must always begin with before you even remotely consider how to execute it. A good idea is the foundation for any great communication piece – including paper craft,' says Jack.



## RESOURCES

A selection of books that offer expert advice, inspirational project examples, templates and instructions:

**Paper Cut: An Exploration Into the Contemporary World of Papercraft Art and Illustration** Owen Gildersleeve, Rockport £16.59

**Creative Paper Cutting: 15 Paper Sculptures to Inspire and Delight** Cheong-ah Hwang, Guild of Master Craftsmen £18.59

**Playing with Pop-ups: The Art of Dimensional, Moving Paper Designs** Helen Hiebert, Quarry £16.99

**Paper Cutting Book: Contemporary Artists, Timeless Craft** Laura Heyenga and Rob Ryan, Kindle edition £17.99

## LEARNING PROCESS

The best plan in the world, however, means nothing until it's executed. Mastering paper craft can take a great deal of patience and perseverance, as Motherbird have discovered. 'The paper folding and production is the most time-consuming, difficult aspect [of this type of work],' Jack reports. 'A lot of time and effort goes into developing these skills, and it takes time to figure out what is and isn't possible.'

Making mistakes is an important part of the process. 'Often you'll have a visual in your head and it isn't until you start to physically compose a piece that you'll uncover what does and doesn't work,' says Jack. 'A lot of our pieces are built over a number of days and often weeks, so they evolve as we go.'

It's vital to remain flexible and enjoy the journey, Yulia concludes. It's through practical trial and error

and highlights for added depth. 'The degree of post-production done on any paper craft piece will depend on the desired result,' muses Jack Mussett of Motherbird. 'For most of our pieces we've sought to achieve a more polished, refined composition that could be mistaken for a

that you'll evolve your technique. 'Future paper artists need to experiment and look further for their own style to really own their craft.'

Lisa Hassell is a design writer, curator and artist and director of Inkygoodness (inkygoodness.com), a showcase for artists working across illustration, character design and graphic art.



# Instant impact in icon design

When it comes to selling an iOS app on the App Store, its developer needs to make sure its icon makes an impression if the product is to stand out from other similar offerings.

If the field in which you're selling is a crowded one, such as photography, you have to work especially hard to make your app compelling. The most common approach, of course, is to use an image of a lens. And if your app has already become well known, then that's usually enough to give browsers an instant indication of what the app does. The icons for Camera Plus **1** and Camera Awesome **2** do little more than present a gorgeous, rendered view of a lens with, respectively, a '+' and a stylised 'A' to identify them from the crowd.

Instagram went in a slightly different direction, deliberately mimicking a retro-styled Polaroid camera, with its 1970s brown tones and viewfinder window making it look very distinctive: even the rainbow stripes are taken from the original Polaroid design **3**. (In a case of life imitating art, Polaroid has now released a camera, the Socialmatic, designed to look like the icon.) It's such a clearly identifying look that third-party apps can piggyback on Instagram's success by aping it, as is the case with apps such as InstaEditor **4** and Vintage Camera **5**.

Apps that add special effects have more difficulty, as it's hard to show these in such a tiny



**STEVE  
CAPLIN**  
GRAPHIC  
DETAIL

space. Camera Wow **6** attempts to get across the excitement with a star behind the lens, while BeFunky places a pair of googly eyes inside the lens **7**. Some dispense with the lens theme altogether: Optika **8** instead relies on a rather confusing engineering-led icon showing a light beam splitting into its component red, green and blue.

What if your app performs a different specific task? Sometimes it's enough to show just the end result. It's clear that Color Effects has the ability to isolate a single colour within an image **9**, and that Old Fart Booth can turn you into an elderly version of yourself **10**, and it's not hard to work out that Pencil Sketch turns photographs into drawings **11**.

When several apps compete in the same space, you often see a marked similarity in icon approach. Both Pic Stitch **12** and Frametastic **13** enable you to combine multiple images into a single collage. But is that pared-down, Mondrian-style icon enough to suggest any photography is involved? Well, consider the alternative. The app Photo Collage performs a similar task, and the icon is based on the same principles, except that it includes images within the three framed areas **14**. While this might be more literal, the end result is that the icon is simply confusing, especially at small sizes. There's no convenient halfway house, as Frame UR Life demonstrates **15**: its app is both stylised and confusing at the same time.





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Some specialist apps get their point across through clever lateral thinking. Picture Safe password protects your photographs, as is more or less evident from the folder full of images with a 3D rendered key mounted on the front **16** (previous page). Rulerphone, an ingenious app that lets you produce measurements from a photographed scene, shows a lens sliding over a ruler, which would be clearer, if perhaps not so attractive, if the ruler was more conventionally coloured **17**.

A personal favourite is the app for Panorama 3D Cities, a beautifully constructed icon in every sense **18**. It depicts an old-fashioned camera, seen from a three-quarter angle, with an image of a city landscape emerging from the side and wrapping around a curve to indicate the 3D quality of the app's contents. The entire icon fits perfectly within Apple's round-cornered square, yet fills the space so well that it feels like a natural shape for it.

When the element of time enters the equation, the problem becomes that much more difficult. How, exactly, do you portray animation? The obvious solution is to use a clapperboard, either with the old camera lens motif, as is the case with Stop Motion Animation Maker **19**, or – perhaps something of a tautology – using a movie camera icon instead, as adopted by Stop Motion Studio **20**. Another approach is to show both a camera and a stopwatch in the same icon, as has been

done by the developers of StopMotion **21**, but this is harder to take in at a glance, and the tiny misspelling of 'Seconds' doesn't help. Interestingly, the market leader, Boinx, eschews all the usual trappings, instead opting for a far more graphic interpretation **22**. The graphic approach is all very well, but if you're going to use it, make sure the concept of 'pro' isn't deflated by the icon, as is very much the case with Animation Maker Pro **23**.

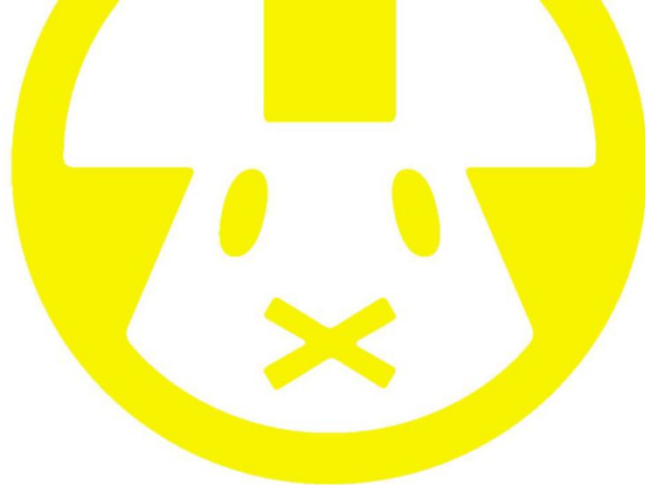
Timer apps, and those that slow down movies and shutter speeds, are even harder to depict. Slow Shutter gives little indication of its purpose **24**; SloPro sort of suggests a timer **25**. Self Timer, showing a camera lens as a rotary speed dial, meets the challenge rather well **26**. And the two cameras in the Reverse Camera icon would get the point across if they weren't so invisibly small **27**.

If your brand is well known and strong enough, you can get away with repeating it within the icon, as is the case with both Photoshop Express **28** and the rather better Photoshop Touch **29**. But you need the strong brand first. Few app developers can get away with just a single letter, as is evidenced by the icons for Tadaa **30**, Text Camera **31** and Text On Pictures **32**.

Icon design is a factor of app development that's often overlooked by software engineers, who can regard it as an optional extra. It isn't. A good icon isn't a luxury, it's a necessity.

**Steve Caplin** is a designer and illustrator working for a range of national newspapers. His best-selling book *How to Cheat in Photoshop* is published by Focal Press. This column appears monthly.





# Helvetica: still pulling its weights

Helvetica is the world's most popular typeface. Not everyone likes it, often precisely because of this, but for decades now it's been everywhere you look: shop signs, clothing labels, logos, packaging, the iOS interface – and now, of course, OS X. One of Yosemite's many changes was the booting out of Lucida Grande as the system font in favour of Helvetica. Or rather Helvetica Neue, a *newer*, subtly redesigned version of the font design. Neue, as German speakers will know, rhymes with Toyah.

Helvetica was drawn by Max Miedinger and released in 1957, the same year as Adrian Frutiger's Univers. There's a truism, based on relative differences in character shapes and underlying structure, that Helvetica is for modernists and Universe is for humanists, but both quickly became popular with designers looking for clean, modern type designs that wouldn't push too much of their own personality into the mix. For whatever reasons, it was Helvetica that slipped into the role of default typeface for so many printers and signmakers.

Ever since it first appeared, Helvetica has been tweaked and adjusted both to help it work better in the different typesetting systems of the day and to provide a range of different type weights. It was an uncoordinated evolution, which meant the different variants didn't always sit well together. You'd even find one cut of Helvetica Regular would differ from another, if you compared across hot metal,



**KEITH  
MARTIN**  
DESIGN  
COUNSEL

PORTRAIT: ALYS TOMLINSON; ALYSTOMLINSON.CO.UK

photoset and other technologies. In 1983, the type foundry Stempel AG released a complete reworking of the core design with a broad range of widths and weights, all developed consistently from the central 'Regular' design. The family was called Neue Helvetica, later reworded to be Helvetica Neue. If you swap old-school Helvetica for Neue, you'll see a slight shift in character spacing, but the differences in character shapes won't be obvious without scaling things up to at least headline sizes and perhaps laying one version on top of the other.

Along with the subtle improvements in clarity and consistency, one of the great things about this new Neue family was the use of a numbering system to identify weights, widths and styles. This is the same system Frutiger created for Univers, back when both type designs first appeared. The logic is simple: '55' is Helvetica Roman, the standard weight (neither bold nor light) and width (neither expanded nor condensed). The tens part of the number rises as the weight goes up: 65 for Medium, 75 for Bold, 85 for Black and 95 for the ultimate Extra Black. At the other end of the scale, 25 is Ultra Light. The units part of the number conveys two things: width (3 is wider than 5, 7 is more condensed) and style (odd numbers are upright, even numbers are italic).

As with Univers and the handful of other large type families that use this naming system, it

### ❶ Swiss watch

In case you hadn't noticed, iOS and OS X have both adopted Helvetica Neue as their system font

### ❷ Number games

Helvetica Neue uses a logical numbering system to identify its different weights, widths and styles

❸ **Perfect tens** The tens column in the number identifies the weight of the font, as you can see here with these pangrams. (The condensed family is not used by Apple)

1



**Keith Martin** is MacUser's technical editor. An Apple user since the beginning, his background is in graphic and interactive design. This column appears monthly.

makes things extremely clear once you know how it works. So why don't the font files that now come with the Mac OS use this numbering system? It's hard to say for sure, but my guess is that it has something to do with hiding the fact that, while you do get a reasonable 11 variants, it's far from the complete set. The full Helvetica Neue family has a massive 51 members, but licensing them all would have been a massive and, for most users, totally unnecessary expense by Apple.

Type designers have been weighing in with their opinions of Apple's switch to Helvetica Neue as OS X's system font. Tobias Frere-Jones said Apple 'might have made a mistake' with this, and Khoi Vinh laid into iOS 7 for its use of Helvetica Neue – to be fair, mainly for its initial use of the ultra light weight, since swapped for slightly less skinny styles. Most typographers' opinions seem to be along the lines of 'Helvetica? As an operating system's core display font? Preposterous!' I don't agree, although I admit it's taken me years to come around to the idea of using Helvetica in my designs.

One thing's certain: without Retina displays, this would be a questionable choice. At the sizes used in menus and other interface elements, Helvetica simply isn't that well suited to the coarseness of old-school chunky pixel grids. The menu bar on a non-Retina iMac looks noticeably blurry after upgrading to 10.10. In the early days of the

Mac, the system font for menus and the like was Chicago, somewhat inspired by Helvetica but drawn for crude 1-bit screens. Mac OS 8 switched this to Charcoal, then with OS X the system font became Lucida Grande. This was the first Mac system font to be taken from print roots, but it was still chosen to ensure legibility on low-res displays, and supplied bitmapped at the sizes used by the UI.

Helvetica has never looked great at small sizes on older displays, but the print-like dot pitches of Retina screens do it justice. I now write mostly in Helvetica Neue Light at 10pt (at 125% zoom, so effectively 12.5pt), and I find it as clear as fonts made specifically for screens (Espy Sans, Geneva, Verdana and so on) were on pre-Retina displays. It's as comfortable on screen as in print.

If you still think Helvetica is a cliché, take a look at the full range of weights available and see what you can do with some of the lesser-used ones. Of course, by making it 'the Mac font' as well as the iOS system typeface, Apple may be leading us to a stage where it really will feel too ubiquitous to bear – but remember one of the things that made it so popular in the first place was its versatility.

Try Light or Thin instead of Regular. Even try the skeletal Ultra Light, although, please, only set it very large. And do look seriously at getting more cuts; Apple's freebie 11 are useful, but it's just a small percentage of the full Helvetica experience.



	extended	extended oblique	regular	italic	condensed	condensed oblique
ultra light	23	24	25	26	27	28
thin	33	34	35	36	37	38
light	43	44	45	46	47	48
roman	53	54	55	56	57	58
medium	63	64	65	66	67	68
bold	73	74	75	76	77	78
heavy	83	84	85	86	87	88
black	93	94	95	96	97	98
	bold outline	75	extra black	107	108	2

3

Forsaking monastic tradition, twelve jovial friars gave up their vacation for a questionable existence on the flying trapeze (27) The July sun caused a fragment of black pine wax to ooze on the velvet quilt (37) Sphinx of black quartz, judge my vow (47) A quart of oil mixed with zinc oxide makes a very bright paint (57) We quickly seized the black axle and just saved it from going past him (67) No kidding; Lorenzo called off his trip to visit Mexico City because they told him the Conquistadores were extinct (77) While making deep excavations we found some quaint brone jewelry (87) Amazingly few discotheques provide jukeboxes (97) ‘Ask for two vain zebras,’ the highly excited MacUser judge quipped (107)



# TECH NIK

[PRIMER]

## *Shed light on colour*

Make sure you know your RGB  
from your CMYK and  $L^*a^*b^*$

Expressing colour in numbers is difficult, and no system is perfect. This is because it can be emitted as light, as from your display, or scattered from a coloured surface, perhaps a printed image; and it's perceived in relation to ambient and incident light. The most common and basic systems give separate values for primary colour channels: red, green and blue (RGB) for emitted light; or cyan, magenta and yellow (CMY) for coloured surfaces – the latter may have a black fourth channel when printing with dyes, making CMYK.

Given eight bits of data per channel, an RGB value of 0 0 0 represents blackest black, and 255 255 255 is pure white – although floating-point numbers are increasingly replacing integers in apps. Mix pure red with pure green (additively, in emitted light) and you get an RGB of 255 255 0, the secondary colour yellow. However, in a

subtractive system, such as for printing, yellow is a primary colour, represented by a CMY value of 0 0 100 (normalised on the scale 0-100, as is usual).

The human eye can perceive far more colours than can be represented using three channels of values ranging from 0 to 255, and neither RGB nor CMY systems separate tone or lightness from hue or chromaticity, something accomplished much better by the  $L^*a^*b^*$  system (sometimes referred to as Lab or LAB). While  $L^*$  corresponds to lightness, ranging from 0 (black) to 100 (white), the  $a^*$  and  $b^*$  channels express chromaticity in a complex way. The latter are 0 for achromatic white and black, but the full  $L^*a^*b^*$  value for sRGB primary red is 53.2 80.1 67.2, and that for secondary yellow an even less comprehensible 97.1 -21.6 94.5.

You'll also come across other ways of quantifying colour. The 'gold standard' preferred by most colour scientists is XYZ, but that's seldom used in everyday computer apps. An alternative to  $L^*a^*b^*$  is  $L^*u^*v^*$ , in which the latter two channels express chromaticity in a different but equally complex manner. Munsell charts and codes [continued on p84]





IMAGE ISTOCKPHOTO.COM/SILVERV

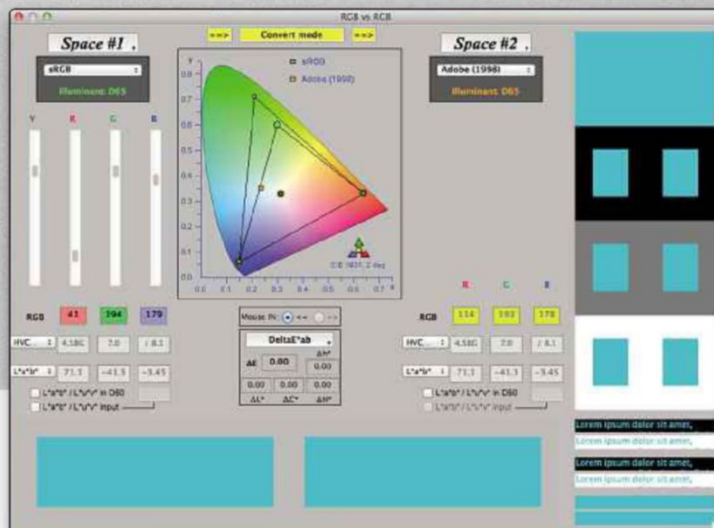
## Converting colours

ColorSync Utility, started by opening a colour profile in Displays or from / Applications/Utilities, provides colour profile tools and a basic conversion calculator. Set the colour system (RGB), conversion or rendering method (perceptual), colour space (sRGB) and colour channels. Change the other side of the window to a different colour system ( $L^*a^*b^*$ ) for conversion. Version 4.9 has bugs in Mavericks, and

→ **Get serious** Extensive conversions are but one of the features of BabelColor CT&A, an essential tool for those serious about colour

samples displayed may not match settings.

BabelColor CT&A (£104 from [babelcolor.com](http://babelcolor.com)) has extensive support for conversions between systems, colour spaces and much more, and is an essential app for anyone who is serious about colour.



Most popular conversions are available in its RGB vs RGB tool, where you can set up channel values in a chosen RGB colour space, whose gamut is displayed on the central colour space graph. Below the set RGB values are XYZ,  $L^*a^*b^*$ ,  $L^*u^*v$  and even Munsell HVC equivalents.

Colour patches and samples are shown so you can see any differences arising from the conversion. You'll see, for instance, how an sRGB of 141 194 179 converts accurately to an Adobe (1998) RGB of 114 193 178, but both RGB colours are identical in  $L^*a^*b^*$  and XYZ.

[continued from p83] are aimed more at those using colour in design, but because they adopt such a different approach, they're hard to convert to or from more conventional systems such as RGB or  $L^*a^*b^*$ , usually requiring lookup tables.

Three important complications are colour spaces, rendering intent, and the colour temperature of the light-illuminating surfaces.

Within the all-encompassing laboratory standard of XYZ, narrower spaces such as sRGB can express only a subset of colours, and these are further limited when set in the context of specific devices such as printers. When converting between colour spaces, or 'gamuts', there are alternative strategies known as 'rendering intents'. These include perceptual, which tries to render the colour as closely as possible to what we perceive, and absolute colorimetric, which makes the best

physical approximation. You can experience the effects of different rendering intents in the Print dialog of apps such as Adobe Photoshop.

The colours of surfaces change according to the colour temperature of the light that illuminates them. Two common lighting standards are D50 (5,000K light, typical of fluorescent lamps) and D65 (the bluer 6,500K light, typical of overcast daylight), and their effects can be observed in apps that accompany colorimeter peripherals such as ColorMunki Design. Try to keep to a single lighting standard appropriate to your purpose.

Everyone working with colour, even adjusting digital photos, needs to calibrate their display; the basic calibration offered in System Preferences > Display is better than nothing, but investing in a better system using a sensor device will avoid shocks when colours come out wrong.



# Q&A

**THEY CAN HELP** Apple's technical support system, Knowledge Base, is always available online. At [support.apple.com](http://support.apple.com), search for answers on any Mac or iOS topic. If you need help with a product, enter its serial number at [selfsolve.apple.com](http://selfsolve.apple.com) and Apple will show your support, warranty and repair options. (There's a link here to where to find the serial number.) Or try [getsupport.apple.com](http://getsupport.apple.com) for quick guidance. For user manuals, see [support.apple.com/manuals](http://support.apple.com/manuals).

**WE CAN HELP** If you have a Mac or iOS problem, write to Howard Oakley at [help@macuser.co.uk](mailto:help@macuser.co.uk). Explain the issue, giving details of hardware and software. Or tweet @macusermagazine with a question and we'll tell you the answer if we know it.

**YOU CAN HELP** Some problems are rare, but few are unique. At [discussions.apple.com](http://discussions.apple.com) you can ask questions, search posted answers, and help out other users with your own solutions.

## Moving up

**Q** I am trying to migrate applications and documents from my old MacBook Pro to my new one, but Migration Assistant isn't playing nicely. How can I get it to work? *Duncan Bruce*

**A** Begin with both Macs shut down, connected back to back with an Ethernet cable (or on a wired network). First, start up the older one, log in, open the Sharing pane and turn on file sharing, enabled for the whole drive. Check in the Security pane that the firewall is turned off and make a note of its IP address in the Network pane. Start up the new Mac, log in and start Migration Assistant. If this doesn't work, use the Connect to Server command in Finder's Go menu to connect to the hard disk of the old Mac and run Migration Assistant again. If the new Mac can't see the old one, check their IP addresses are different, but on the same sub-net – only the last number in the address should differ. If necessary, open the Network pane on the new Mac and set its IP address to be adjacent to the old Mac, on the same sub-net.

## Scratch that

**Q** I'm thinking about installing Mavericks, but have partitioned my internal drive for photo storage on Photoshop's scratch disk. Should I repartition it? *David A Hardy*

**A** There was a time when partitioning large hard drives brought performance improvements. Currently, the HFS+ file system performs well even with millions of files on huge drives, and there's nothing to be gained by having two or more partitions. The obvious exceptions are for Boot Camp or to switch between different versions of OS X. You'll be better off initialising your hard disk to create a single partition, although Mavericks may create a small hidden recovery partition. You then need to keep ample contiguous free disk space on this partition, which will ensure scratch files can be allocated readily for optimum performance. Given sufficient free space, OS X will routinely defragment large files to help this, although occasionally it may help to defragment free space manually to restore performance.

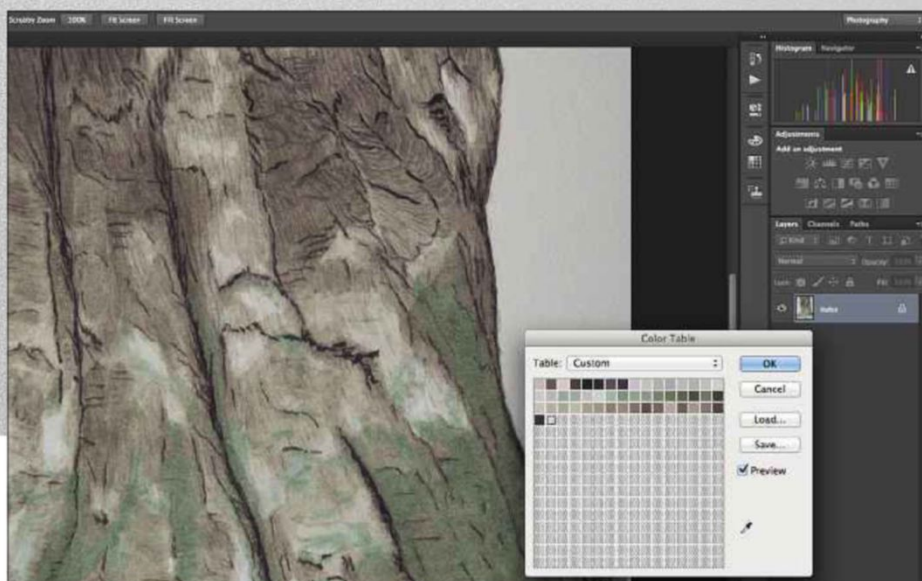


↑ **Forty winks** In Mavericks, some applications can nap when they're not active, and may pause to wake. You can disable that in Get Info

## Speed limit

**Q** My new iMac has 8GB of RAM and a Fusion drive on which I use FileVault 2. It seems slow at times, and when I view memory use in Activity Monitor, it's using 7GB of physical memory, pressure 'green', and no swap space. What do I need to change? *Max Griffin*

**A** OS X has a sophisticated memory management system that's designed to get the best out of the physical resources in your Mac. The figures you quote show that it's doing well: there's no point in having 8GB of memory if it isn't fully used, and it was using it so efficiently that it needed no swap file – that is, memory cached to hard disk. That is optimal, and quickest. Running time-consuming background processes such as antivirus and other security software can slow things down, as will FileVault, and some apps can nap when inactive, taking a moment to wake up. You can disable the App Nap feature for individual apps in their Get Info dialog, and that may help your speed issues. If the problem persists, browse logs in Console just after a pause to get better clues.



#### ← Swatch this

Photoshop can convert RGB images into indexed colour, producing a summary palette of the different values used in any image

## Cursory examination

**Q** Sometimes when I select a window or function in an app, it ceases responding, showing the beachball cursor. This has persisted after upgrading to an i7 iMac with 32GB of memory last year. How can I stop this frustrating glitch? *Russell Caplan*

**A** As soon as an app starts to beachball in this way, open Console and watch what's happening in your logs. In your case, it's most probable that something old and incompatible that started the problem on your old iMac has migrated across to the new one. Until you pin down the cause – probably a process crashing repeatedly and being restarted – it is likely to continue to annoy. Also try Safe mode, holding the Shift key after restarting.

## Did you know?

Mavericks and Yosemite can compress the contents of memory to squeeze more into real RAM, and save having to cache out to swap files on disk. Activity Monitor's Memory Pressure indicator remains green when there is little pressure to compress, rising to red when caching to disk, a useful performance measure.

## Take charge

**Q** For the last few months my five-year-old MacBook Pro has shown the message 'Service battery'. I bought a new battery, but the message went before I could replace it. Should I put the new battery in or wait? *Alan Ainsworth*

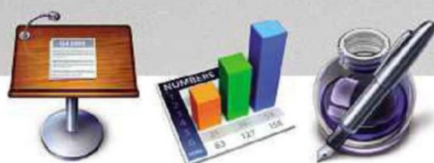
**A** After five years, the chances are that your battery is delivering endurance far below that of the replacement. Although you could wait until you see warnings again, or until the battery is unable to keep it going for long enough, you are just as well replacing it whenever is convenient. You are most unlikely to need the new battery to last a further five years, and will probably be impressed at how long the machine will now operate on battery power.

## Index linked

**Q** I am aware that Adobe Photoshop can display a histogram of colour usage by RGB channel. But how can I get to it show the most commonly used colours in an image and save them to a document? *Dan Twigg*

**A** Most images are by default opened in RGB mode in Photoshop, whereby each pixel in the image has a red, green and blue value. Histograms show the frequency of those values by channel, and give no idea of the actual colours used in the image. To examine those, you need to change to indexed colour. Because this alters the image, first Save As a new image file. Then in the Mode submenu of the Image menu, switch from RGB to Indexed Color. Use a local palette so that Photoshop creates a new palette for each image, making it Perceptual. Then choose the number of colours to use in that palette by interactively adjusting the figure downwards from 256. Click on OK, and the Image/Mode/Color Table command then shows the palette taken from the indexed colour image, and can save it.





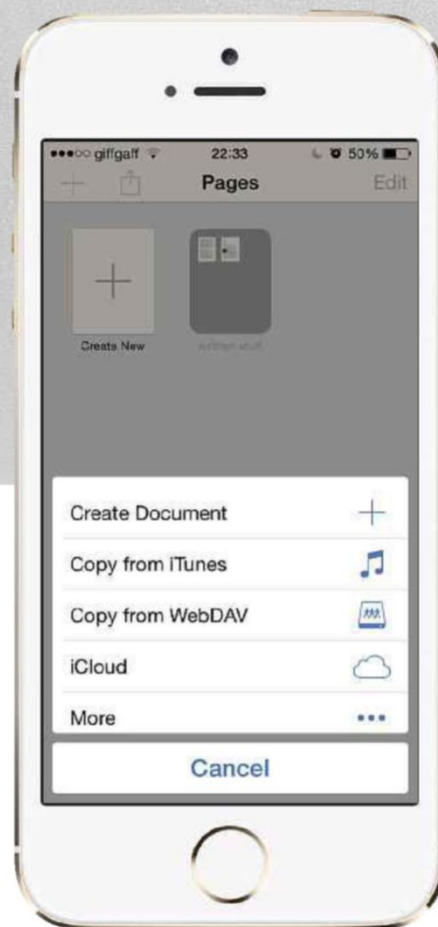
[iWORK PRO]

# Déjà vu all over again

There's a new iWork update!  
I think we all know what this means

'Hope for the best; prepare for the worst'. It's one of those maxims that have swirled around the English language for hundreds of years before finding their natural home in the mouths of every iWork user before they update their favourite suite. The eternal hope is that some of iWork's egregious feature omissions will have finally been addressed. The balancing fear: that Apple will have, yet again, wreaked havoc with its interface or adulterated its file formats.

Reading the small print promoting the latest iWork for Mac update gives evidence of both. There's the tantalising mention of the return of a much-missed feature – Pages' mail merge – alongside the promise of iCloud Drive and the ability to switch seamlessly between iOS and Mac versions of the same file. Against that, the hint of another file format change and another interface rethink.



## ← Cloud formations

Although iWork is deeply integrated with iCloud, you can also open files from alternative online storage providers from within your document

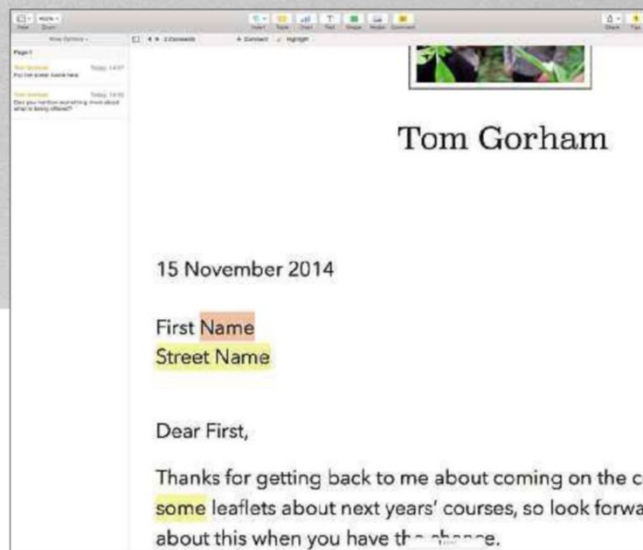
The truth is that the new version, for Yosemite users only, is neither as good, nor as bad as it looks. I'll leave the benefits of iCloud Drive for another column. For now, OS X Yosemite's Handoff is an example of a promising feature that won't deliver much to many users. It enables you to start work on an iWork app on your iPhone and continue it from where you left on the Mac. However, your Mac and iOS devices have to be able to run Bluetooth Low Energy wireless technology. That means iOS devices with Lightning connectors and Macs generally more recent than mid-2012.

As for missing features, those hoping for the arrival of pivot tables in Numbers, or the re-emergence of Pages' linked text boxes, will remain unsatisfied. But Pages 5.5 at least marks the partial introduction of a mail merge feature. Again, it's not quite as good as you'd hope – nothing like the drag-and-drop nirvana of mail merge in Pages '09. Instead, its arrival is part of new AppleScript support for locating and replacing text placeholders. These can now be assigned tags to make them easier to select in scripts. Its *[continued on p88]*



## Storing as smart packages

There's a second reason why you might want to continue to store iWork documents as packages. Because the new single file format is actually just a compressed version of the older format, editing performance can be affected noticeably in very large documents that are stored as a single file. For that reason, if you're editing a file bigger than 500MB, you're likely to be offered an option when saving to store it as a package. It's recommended that you do, unless you plan to share the document on a browser-based cloud storage service that can't deal with packages.



### ↑ New with tags

Add smart tags to text placeholders to address them through AppleScript

### → Simple switch

You can switch files between packages and single files using a menu command

[continued from p87] possibilities go beyond mail merging, because you can replace text with data from just about any data source, and store tagged files as templates.

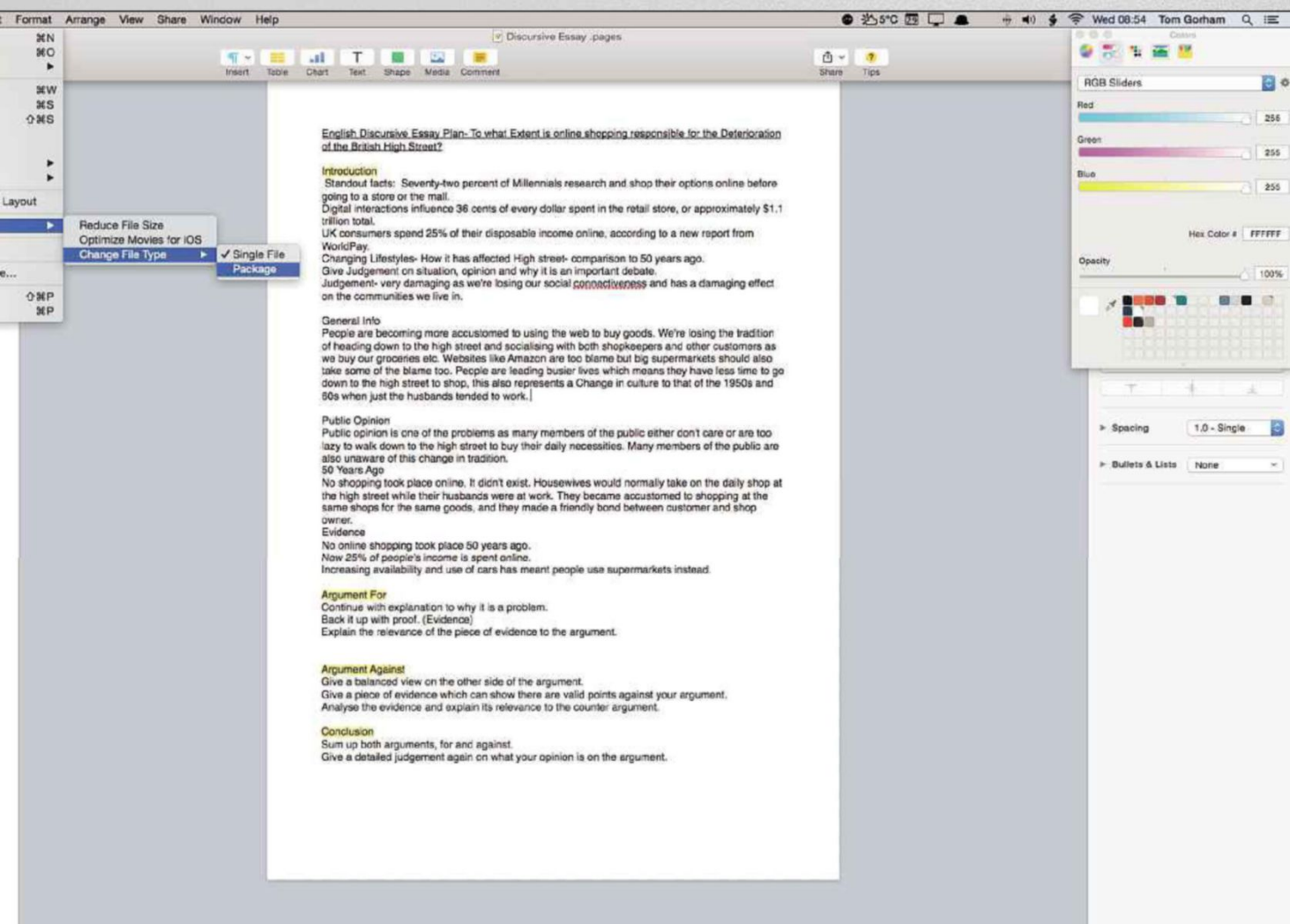
Earlier this year, I explained how you could create a rudimentary mail merge by replacing entire paragraphs of document text via AppleScript. Now that same script, adjusted to use tagged placeholders, offers more precision.

First, though, you need to mark text as a placeholder and assign a script tag to it. Select the text to act as the placeholder and choose Format > Advanced > Define as Placeholder Text. Then select the Text tab under the Format pane. At the bottom, you'll see a drop-down menu for a Script Tag. Enter a name in this script tag field to identify that particular placeholder. In the following script, I've used the tag "FIRSTNAME" for a placeholder that will contain the first name of a mail merge recipient, and so on. The rest of the script grabs data from rows of the frontmost Numbers spreadsheet containing this information, replacing the placeholder text with this and printing the result:

```
tell application "Numbers"
  tell table 1 of sheet 1 of document 1
    repeat with i from 2 to (count of rows)
      set FirstName to value of cell i of column "First Name"
      set LastName to value of cell i of column "Last Name"
      set StreetName to value of cell i of column "Street Name"
      tell application "Pages"
        tell document 1
          set placeholder text {tag:"FIRSTNAME"} to FirstName
          set placeholder text {tag:"LASTNAME"} to LastName
          set placeholder text {tag:"STREETNAME"} to StreetName
        end tell
      end tell
      print document 1
    end repeat
  end tell
end tell
```

**CONVERSELY, WHAT TO** many might have sounded like ominous news of a revamped interface and a new file format (another new file format!) turn out to be better than expected. The interface looks smarter without dropping features. Pages'





**Tom Gorham** has worked with Macs since 1991. Although his background is in print and web publishing, he's a devotee of any software that makes life easier.

Yosemite-inspired toolbar, for example, is functionally identical to its predecessor.

iWork's new file format is also unarguably an improvement, even if its native file format is still the .iwa format, rather than its friendlier, pre-iWork 5 XML-based predecessor.

So while iWork documents remain impregnable to other applications, the file format change now means that, by default, iWork documents are now stored as single files, rather than packages. This is significant. At a stroke, it makes iWork files shareable through storage providers such as Dropbox and Gmail, or recoverable through online backup services such as CrashPlan, which struggled to cope with older iWork packages.

This change also opens up iWork to other storage providers within the app. Tap the '+' symbol at the top of the iWork app's Document Browser window and in the resulting menu, tap 'More'. iWork should let you select any third-party storage providers whose apps are installed on your iOS device. Once enabled, those providers should appear in the list of sources.

It doesn't work for all apps yet, though. At the time of writing, for example, you can't open files directly from Dropbox. Hopefully, a Dropbox update should fix things.

You can still opt to save documents in packages by choosing File > Advanced > Change File Type and selecting the file package option. This is an important concession. While there's a minor editing performance benefit from working with a package (see 'Storing as smart packages', opposite), the main reason is the result of the new file format being part of a Yosemite-only update.

You need to save the app as an old-school package to allow it to be opened on Macs running Mavericks and earlier operating systems, since, once again, Apple has made this latest file format incompatible with all older iWork versions. A document saved as a single file can *only* be opened in Pages 5.5 running on OS X 10.10 Yosemite, in iOS 8, or in iWork for iCloud.

It does make you wonder if you should bother saving in iWork's native file format at all. One day, perhaps, we'll have a single format that just works.

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# PRODU



#### No fear or favour

All reviews and ratings are the result of hands-on testing. (When we preview an upcoming or untested product, we'll say so.) Our testers are daily pro users and experienced journalists. We don't tell them what to say. They just tell you what they think

#### Believe the mice

MacUser's mouse ratings have been respected for more than 25 years. **Five** mice means a product is as good as we think it feasibly could be. **Four**-mouse products are excellent and recommended. **Three** mice indicates a competent but average product. Different products suit different users... but if you see **two** mice or fewer, think twice

#### Game of thrones

Our rosettes are awarded to the products we'd buy ourselves, whether because they're the best, the most progressive in their approach, or the most cost-effective. Look out for the 'E' or 'V' symbol in the margin of a review

**Seen and heard**  
Dell's 5K monitor incorporates 2 × 16W stereo speakers

## Dell UltraSharp 27 Ultra HD 5K

Apple's announcement of the iMac with Retina 5K display was marred only by one limitation: the machine can't be used as an external monitor for another Mac. Nor has the company unveiled a standalone version of its 5120 × 2880 screen.

This might seem a crazy omission, but there's a straightforward technical explanation for it. No current interface – not even Thunderbolt 2 – is designed to shift bits fast enough to handle that many pixels 60 times a second.

To make it happen, Apple has built its own timing controller for the new iMac, which appears (the details haven't been released and aren't easily reverse-engineered) to be using a modification of the DisplayPort 1.2 or 1.3 standard to

allow the iMac's AMD Radeon GPU to drive its 5K panel at a flicker-free 60Hz. This evidently works fine as an internal kludge, but doesn't provide any means of accepting external input.

Apple must presumably be working on that if it intends to release a successor to the 27in Thunderbolt Display – it would look daft if this offered lower resolution than the iMac – but there's no indication that it's in any hurry. The company decided a long time ago that it didn't really want to be a peripherals **maker**, and it's actually conceivable that it won't choose to stay in the monitor market at all.

That leaves the field open, at least temporarily, for other manufacturers to offer

[continued on p94]

IMAGE ADAM BANKS IMAGE COURTESY OF DELL







[continued from p92] Mac owners and other high-end users a 5K monitor.

The first manufacturer to step up is Dell. Its UltraSharp range is already popular with creative users who don't want to invest in a top-end graphics monitor from the likes of EIZO but need something with plenty of pixels and a decent colour gamut. Although its recently introduced 4K models haven't been received with such consistent acclaim as its conventional big screens, the Ultra HD 5K is bound to pique the interest of those who'd hoped for an Apple version.

Dell's approach to the interface problem is relatively straightforward: the monitor comes with twin DisplayPort inputs, so you'll connect it to a computer as if it were two

separate screens. How this will be supported by Macs and OS X we have yet to see, but Dell does list the screen as being Mac-compatible, and even the Mac mini can drive two 2560px screens. It also has a single Mini DisplayPort connection for use at a maximum of 4K with scaling, so it's technically compatible even with computers that can't take advantage of its native 5K resolution.

How the quality of the display will compare to Apple's remains to be seen. During the launch of the Retina iMac, Apple's Phil Schiller was keen to point out all the innovations in the construction of the 5K LCD panel that were unique to Apple, although it's made by LG.

Dell doesn't make its own LCD panels, so whoever it's buying them

from, we can expect to see other brands building monitors around their technology in the near future, and others will no doubt emerge. Once you've seen Retina on the iMac, you'll want it, and demand for 5K monitors is bound to grow.

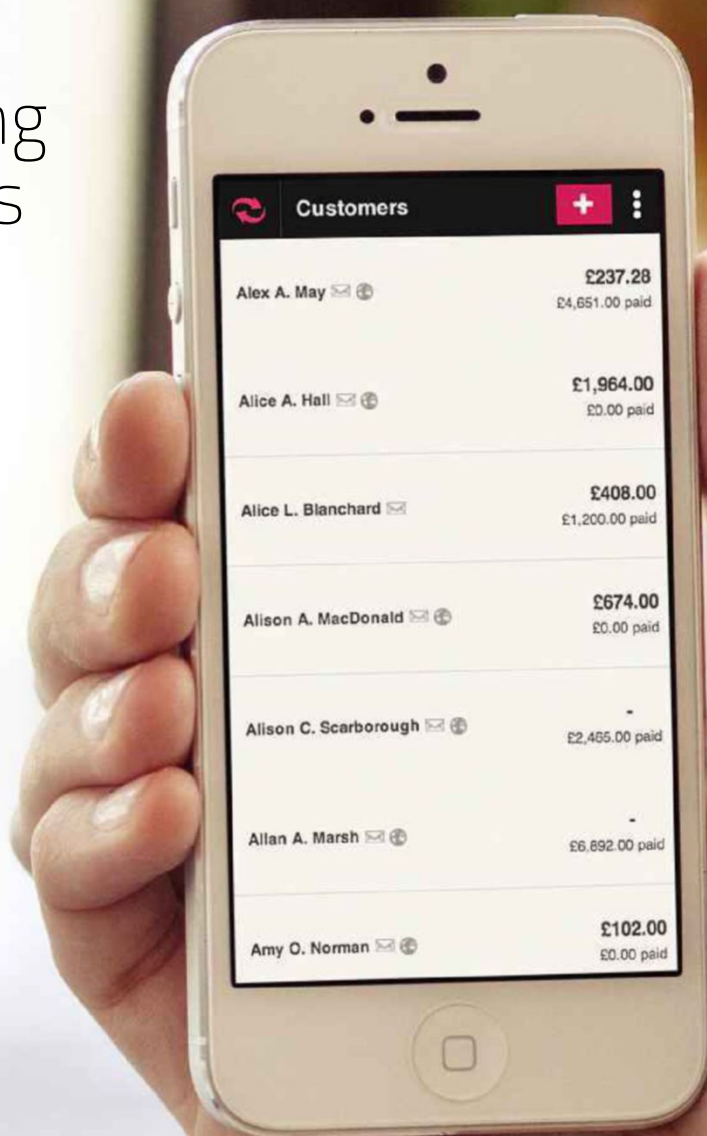
The UltraSharp Ultra HD 5K, like the iMac, displays 5120 × 2880 pixels at a refresh rate of 60Hz (no 30Hz nonsense like Dell's low-cost 4K P2815Q). Its 10-bit colour gamut is claimed to deliver 100% sRGB or 99% Adobe RGB, with a 1,000:1 contrast ratio and 350cd/m<sup>2</sup> brightness. It's listed at \$2,499, but Dell has hinted to journalists that this will fall below \$2,000, although it's not clear if this refers to dealer discounting. In the UK, we'd guess at £1,799 including VAT.





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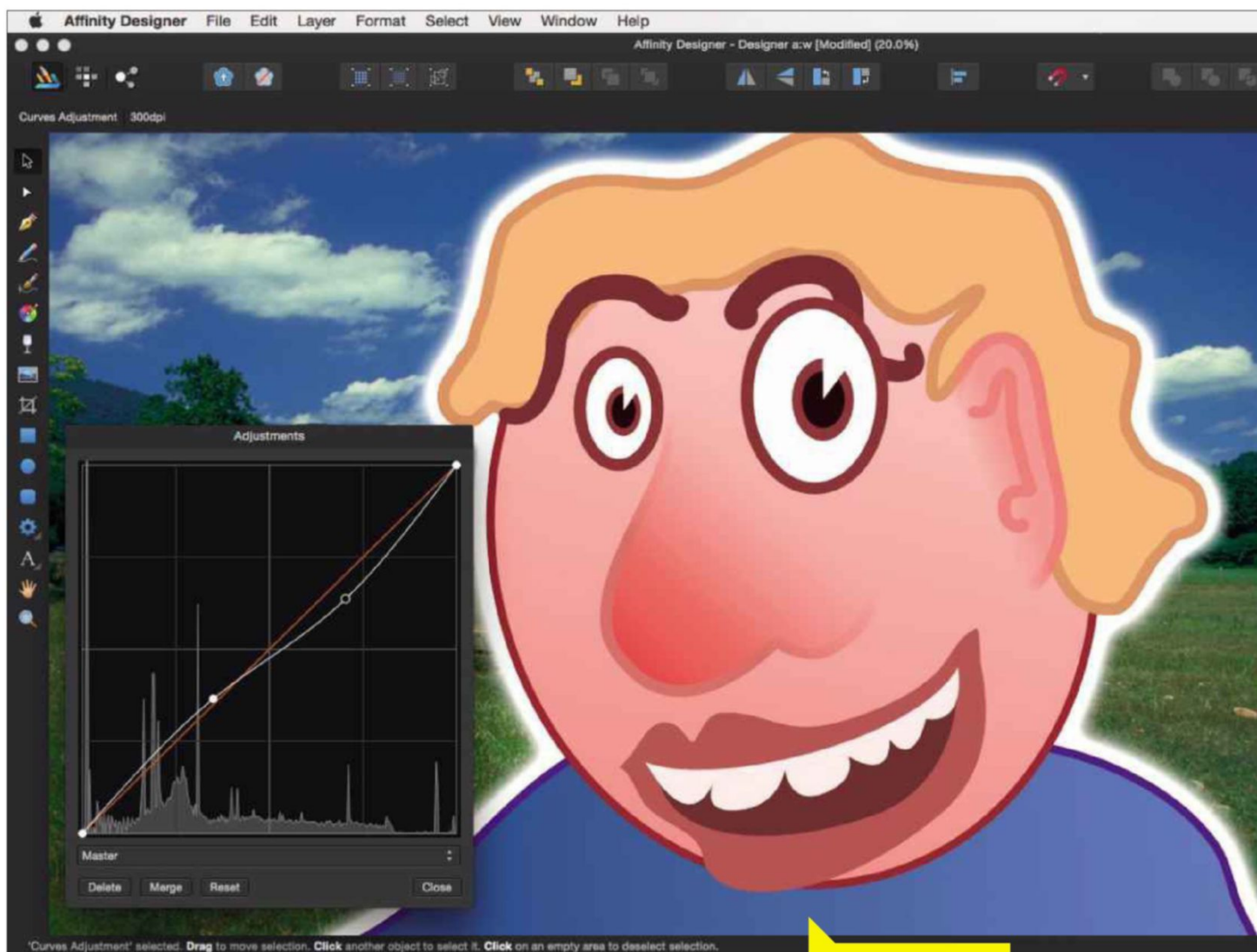
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**Nice curves** You can apply Photoshop-like Layer Effects to objects or entire layers

## Serif Affinity Designer



Affinity Designer arrives as one of very few vector drawing programs on the Mac. It offers the usual array of drawing tools that will be familiar to Illustrator users, but the lightweight Affinity brings a freshness of approach that's more nimble than Adobe's behemoth.

The limited toolset belies a deeper sophistication. The Polygon tools let you draw stars, cogs, pie charts, clouds and more; handles on the objects let you adjust them while drawing and later. Modifier keys perform additional functions, such as moving points symmetrically and ignoring grid snapping.

Affinity has many more tricks up its sleeve. Each layer can contain multiple objects, each listed with both a name and a recognisable icon. It then allows you to apply Photoshop-like Layer Effects to objects or to entire layers.

Again echoing Photoshop, you can even apply Adjustment Layers to layers full of objects, using Curves, Shadows/Highlights, Levels, Posterise and so on to change the look of a group of objects. And every action is listed in a History palette.

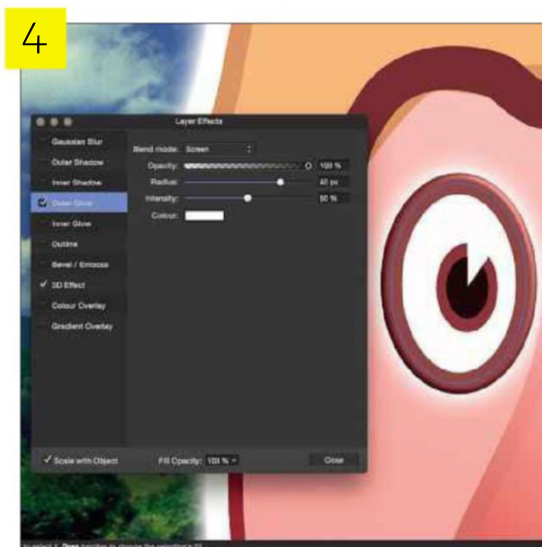
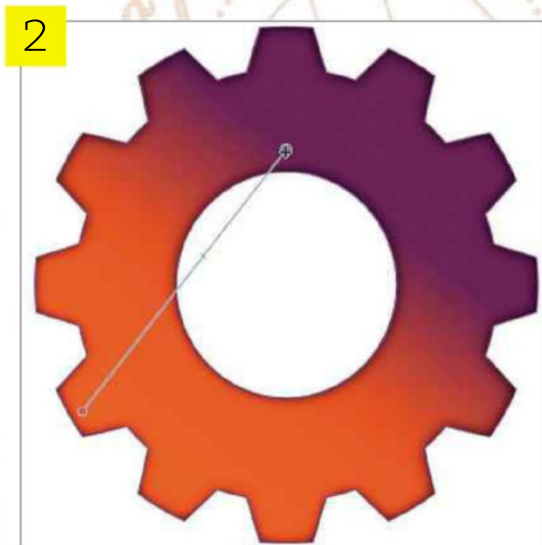
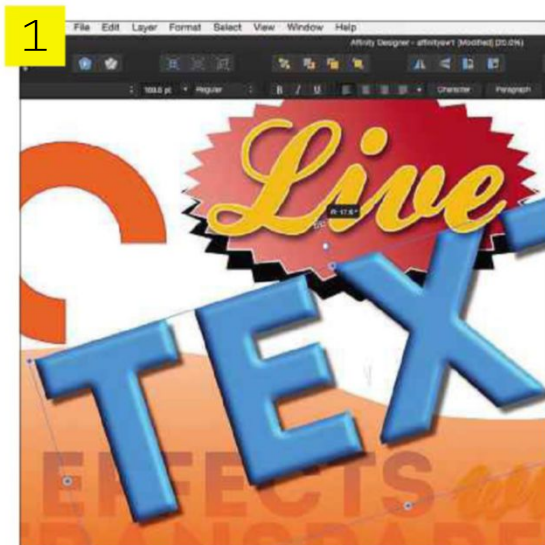
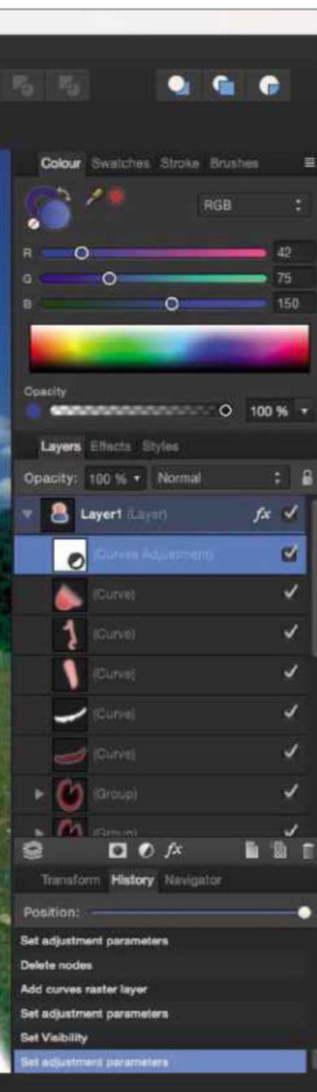
Several tools are striking in their simplicity. To use the Gradient

tool, drag it across the object and you can adjust the endpoints and midpoint at will; the Transparency tool applies a fade effect to an object in the same way. There are handy buttons for common tasks such as flipping objects.

The CMYK mode, for print design, helps avoid out-of-gamut colours. RGB documents, for screen delivery, feature two Pixel Preview modes, standard and Retina, which you can easily toggle between, before exporting both.

Affinity isn't ready to replace Illustrator: there's no autotracing, no graphing, no variable width





stroke; there's also no automatic redrawing of Pencil paths, no text on a curve and no envelope distortion. But its smooth operation, incredible zoom (up to 300 million percent) and friendliness make Illustrator look very tired indeed.

This is the first of three Affinity apps – expect Photo and Publisher next year – and it's a hugely promising debut. **STEVE CAPLIN**



Vector drawing software for the Mac  
See [serif.com](http://serif.com)

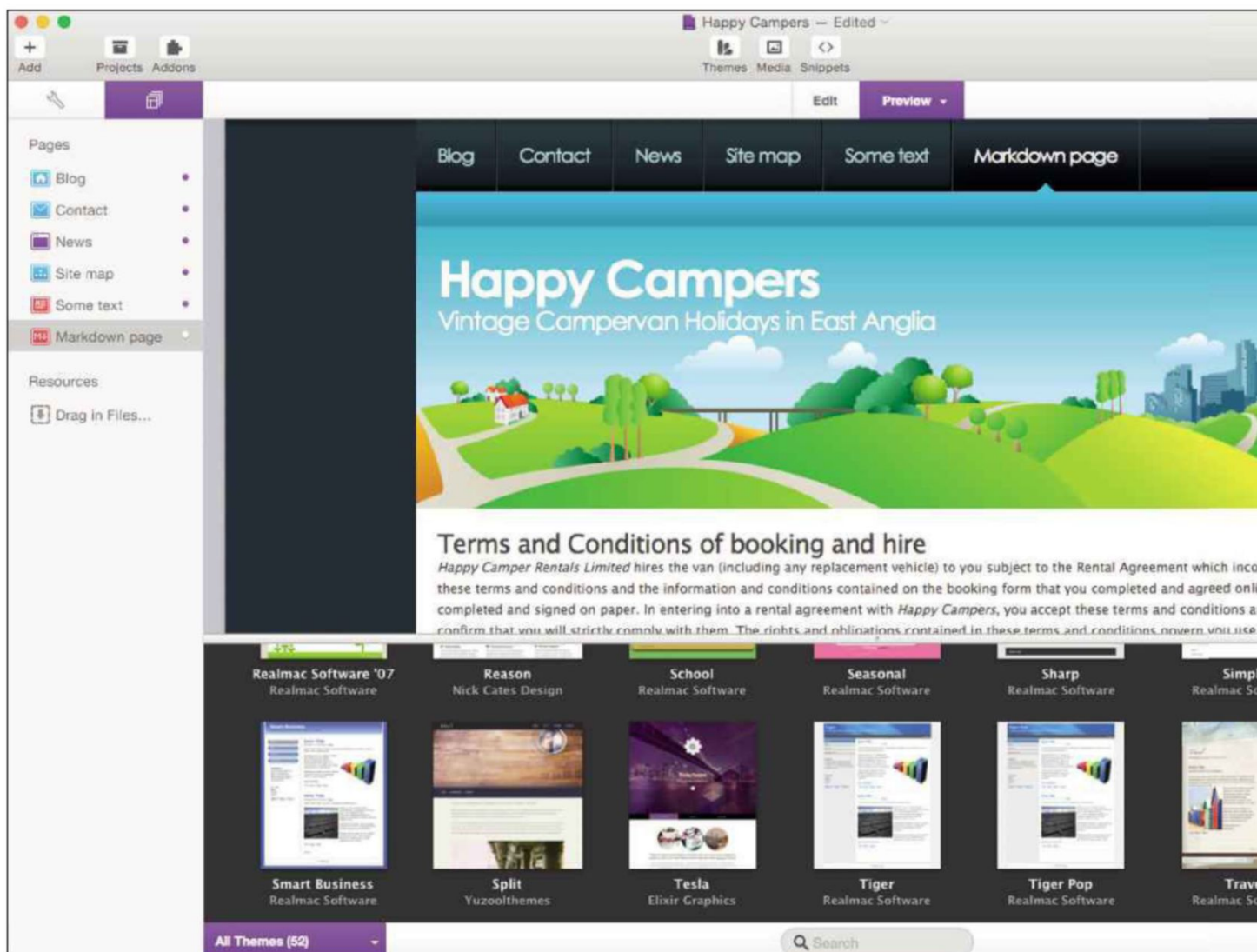
**£34.99** from the Mac App Store  
Requires OS X 10.7 or later, 64-bit processor

**1 FREE ROTATE** Any object can be rotated at will, with a readout showing the angle of rotation, and then rotated back again at a later date, with the option of snapping to the original orientation. It's taken Adobe Illustrator 20 years to come up with even a partial implementation of this approach.

**3 PIXEL PERFECT** When designing for the web, you can view a pixel representation of the vector artwork at both regular and Retina display resolutions. Moreover, you can tell Affinity Designer to snap to grids, guides, other objects, and pixel boundaries. A wide range of export formats is supported, from JPG and PNG to TIFF and EPS.

**2 AT A GLANCE** Tools show their workings without interrupting your workflow. To use the Gradient tool, just drag it across the object and move the endpoints to where you want them. The Effects panel shows the parameters for each effect clearly and simply, with no need to enter a modal dialog box.

**4 LAYER EFFECTS** You can add Photoshop-like layer effects to single objects or an entire layer, with the same smoothness and speed you'd expect in Photoshop. There's no slow-down as you apply these complex effects to artwork that would leave Illustrator struggling to keep up. Effects can be edited and removed at any time.



## Realmac Software RapidWeaver 6

### Ready to roll

RapidWeaver offers a Pages-like approach to designing for the web



OS X

RapidWeaver lets you build websites using themes. You can design your own using external tools, buy pre-built ones, or use the 52 built-in templates (an increase of five on the previous release, now including responsive options) as your starting point. Drag in images and write your text, and the app produces all the underlying code in the background.

Version 6 has a new, flatter UI, with iWork-style sidebars for tweaking colours and options. A new site-wide code panel lets you paste in more extensive snippets of regular HTML using logically

named input boxes. Dedicated panes for CSS, JavaScript, meta-tags, prefixes and head area objects, alongside the existing favicons and app icons for iOS devices, cater for options too esoteric for theme designers to code and let you easily add tracking code to monitor traffic and visitors.

Themes include multiple page types, including contact forms, blogs and regular styled text. The last of those was previously the only option for generating free-form pages, but it's now been joined by a specific plug-in for Markdown, a system that uses

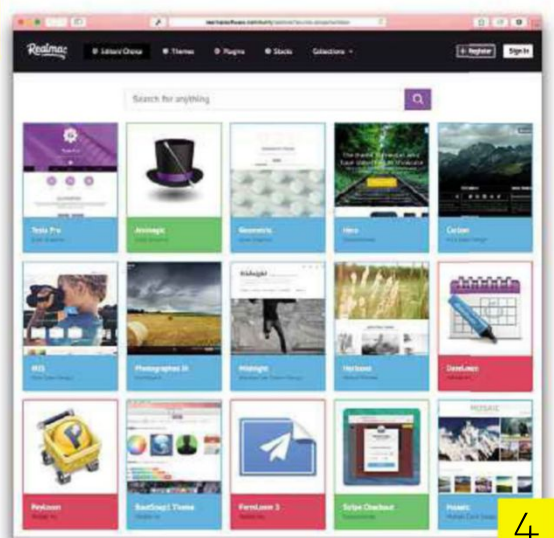
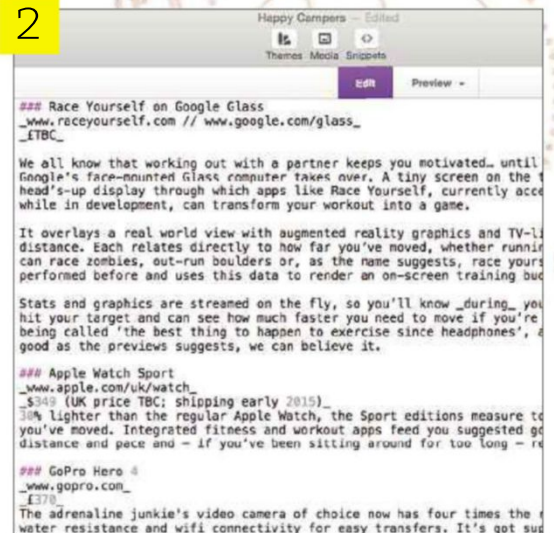
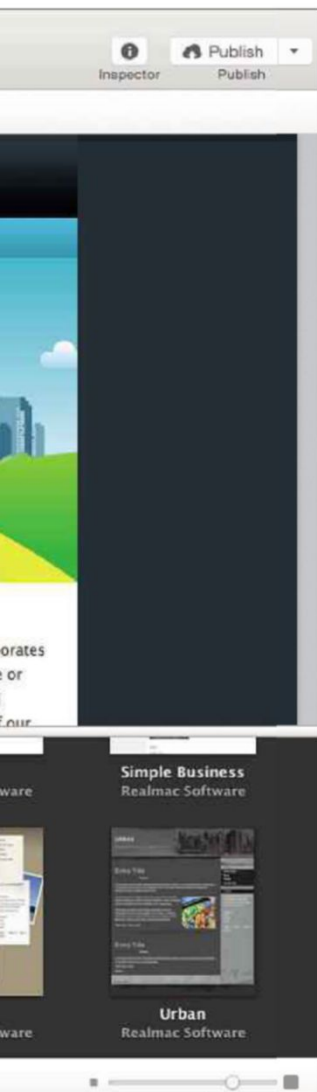
regular characters like # and ## to style headers, single and double asterisks for italic and bold, dashes for list elements, and so on.

This revision supports OS X's Versions and Auto Save, and the FTP engine has been rewritten, now publishing to FTP, FTPS and SFTP for greater security. Realmac Software claims sites should publish up to three times faster.

You can preview your work, and the regular desktop/laptop previews are now supplemented with simulated iPad and iPhone views.

RapidWeaver 6 is a significant advance, yet it's just as easy to use





as its predecessors. You can export existing sites to the version 6 file format from version 5.4, which is a free upgrade for existing 5.x users.

Every conceivable hole has been plugged with this release in what's grown into a well-rounded, fuss-free tool for quickly building, maintaining and publishing sites. If you're still lamenting the loss of iWeb, look here. **NIK RAWLINSON**



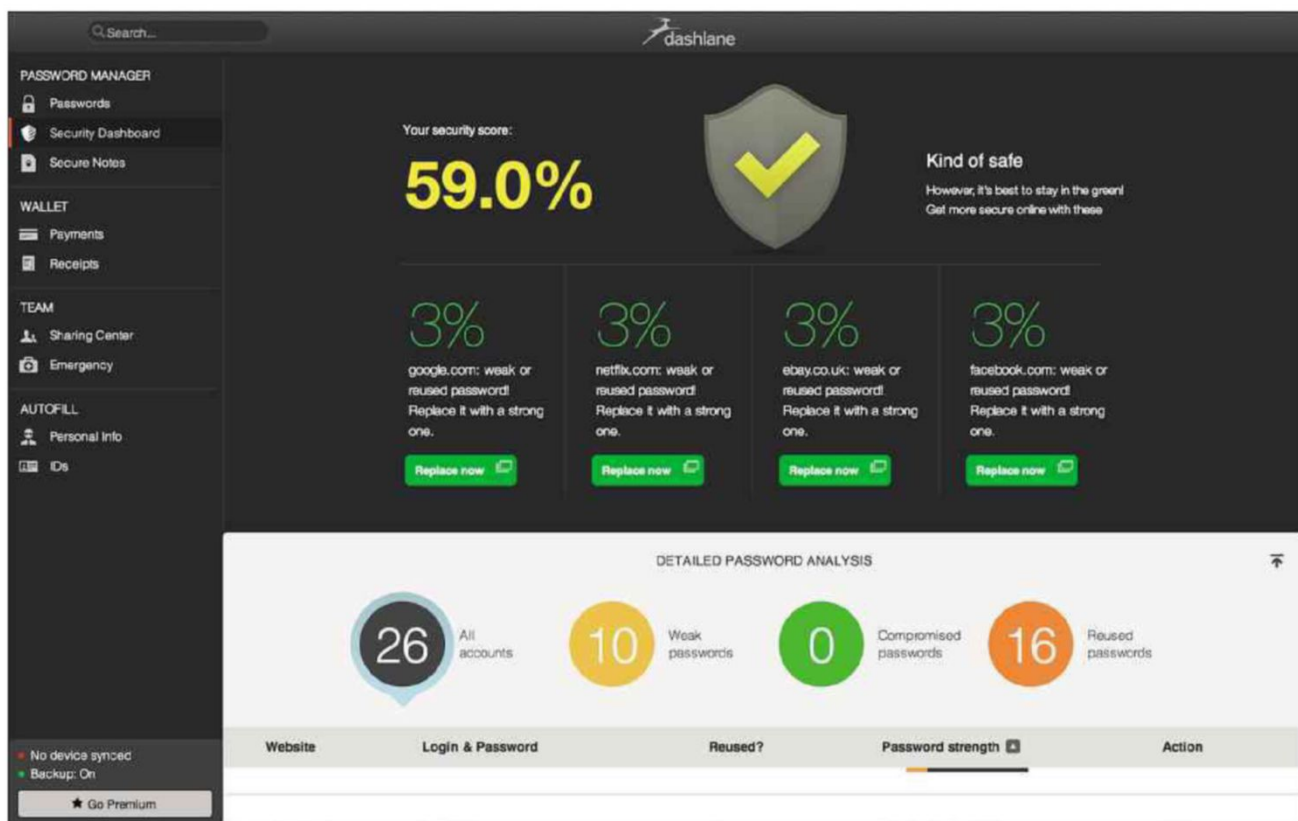
Website publishing software for the Mac  
See [realmacsoftware.com](http://realmacsoftware.com)  
**£59.99** from the Mac App Store  
Requires OS X 10.9 or later. Upgrade £27.49

**1 THEMES WINDOW** The themes are organised in a new addons organiser that indexes templates, plug-ins and stacks (more advanced layout elements) in a unified and quickly scanned window, through which you can add new elements from the new Realmac Software Community site. There are more than 1000 to choose from.

**3 IPHONE/IPAD PREVIEWS** As well as the regular desktop/laptop previews – termed Full Width – you can test your site for compatibility with the iPhone, and both portrait and landscape iPad browsers. This is particularly welcome if you're using one of the new responsive themes.

**2 MARKDOWN SUPPORT** The Markdown environment is ideal if you generate content for multiple platforms, as you can use a third-party Markdown processor (or Realmac Software's forthcoming app Typed) to export RTF and HTML versions of the same file, and paste the raw Markdown into your RapidWeaver document.

**4 COMMUNITY SITE** The new community site is a centralised repository for the full collection of RapidWeaver themes and plug-ins. Many of these are paid-for, premium add-ons. If you know HTML and CSS, you can make your own themes, for sale or for personal use.



## Dashlane

### Strong words

Dashlane makes it easy to use more secure passwords



OS X

The advent of password managers, together with the password features in web browsers, means there's no excuse any more for using passwords that embody the name of your pet, kids or favourite holiday destination. Tools such as Dashlane mean you can create complex passwords and store them in an encrypted vault, easily accessible to you (provided you remember the password for the vault), but safe from prying eyes.

Dashlane's chief selling point compared with its main rival, 1Password (see review, right), is that it's free to download and use. But if you want to sync data between devices, you'll have to pay £20.99 a year for the Premium version. In other ways, but for a slicker, more modern user interface, it's very similar to 1Password.

There are browser plug-ins for Safari, Firefox and Chrome, which allow you to generate secure

passwords and save them, auto-fill those you've already saved and auto-fill forms. Unlike 1Password, there's no Finder menu bar extension, so you'll either have to open the app or use a browser to access Dashlane's features and data.

As well as logins, Dashlane has sections for payment data such as credit card numbers and bank account details, secure notes and receipts. There are no separate sections for email accounts, software serial numbers or databases, so you'll need to store those as secure notes. Nor can you create favourites or add tags.

Passwords generated by Dashlane can be customised before you use them, just as they can in 1Password.

One significant difference between 1Password and Dashlane is their approaches to advising you on the integrity of your passwords. 1Password is very low key, provid-

ing an Audit menu that lets you view passwords that are old, duplicate or weak. Dashlane's 'dashboard' is much more in your face, with bright colours, large symbols and a security score to get its message across. This will be useful for some, but others might find such hand-holding intrusive.

Whether you choose Dashlane or 1Password may be decided by whether you need to sync with other Macs or devices. If not, the fact that Dashlane is free probably gives it the edge. If you do need to sync, two years of Premium works out at about the same price as buying the Mac and iOS versions of 1Password together, so it's not bad value. KENNY HEMPHILL



Password manager for the Mac  
See [dashlane.com](http://dashlane.com)

**Free** from Mac App Store; subscription to sync  
Requires OS X 10.7.4 or later, 64-bit processor



# AgileBits 1Password 5



OS X



Editor's  
Choice

Don't make your passwords easy to guess, the security experts tell us. And don't use the same password more than once. Oh, and don't, whatever you do, write passwords down. Is it any wonder most people ignore them? Well, you don't need to: use a password manager to create and store secure details in an encrypted vault. 1Password, probably the best known example, has now been updated to take full advantage of the new features in Yosemite.

Aside from the visual overhaul, including support for Dark Mode in its menu bar item, 1Password 5 now uses CloudKit to sync with iCloud. This has a few consequences. The first is that iCloud syncing becomes faster and more reliable: CloudKit allows apps to connect directly to iCloud and request data instead of waiting for iCloud to do its thing. It also means, however, that to use iCloud syncing

in 1Password 5 you'll need a Mac running Yosemite and iOS devices running iOS 8. And CloudKit syncing only works on versions of the app from the App Store, not those bought from AgileBits' website.

You can still sync with Dropbox, which isn't affected by the switch to CloudKit, and over wifi. Wifi sync now allows you to synchronise attachments, and starts the process as soon as your Mac and iPhone or iPad are connected to the same network.

1Password is useful for more than just creating, storing and filling in secure passwords. It can be used to store encrypted notes of any kind, and has sections to allow you to securely deposit details of bank accounts, credit cards, email accounts and software licence codes. We find it particularly useful for keeping track of the security questions and codes from online bank accounts, and for credit card

numbers and security codes. If you shop online and find it a pain reaching for your purse or wallet every time you buy something, 1Password is a blessing.

The only criticism we have of the app is one that also applies to rivals: it has a tendency to pop up an offer to store login details, such as one-time codes generated by bank smartphone apps or security key fobs, which you don't want stored because the whole point is you'll never use them again. Understandable, but frustrating.

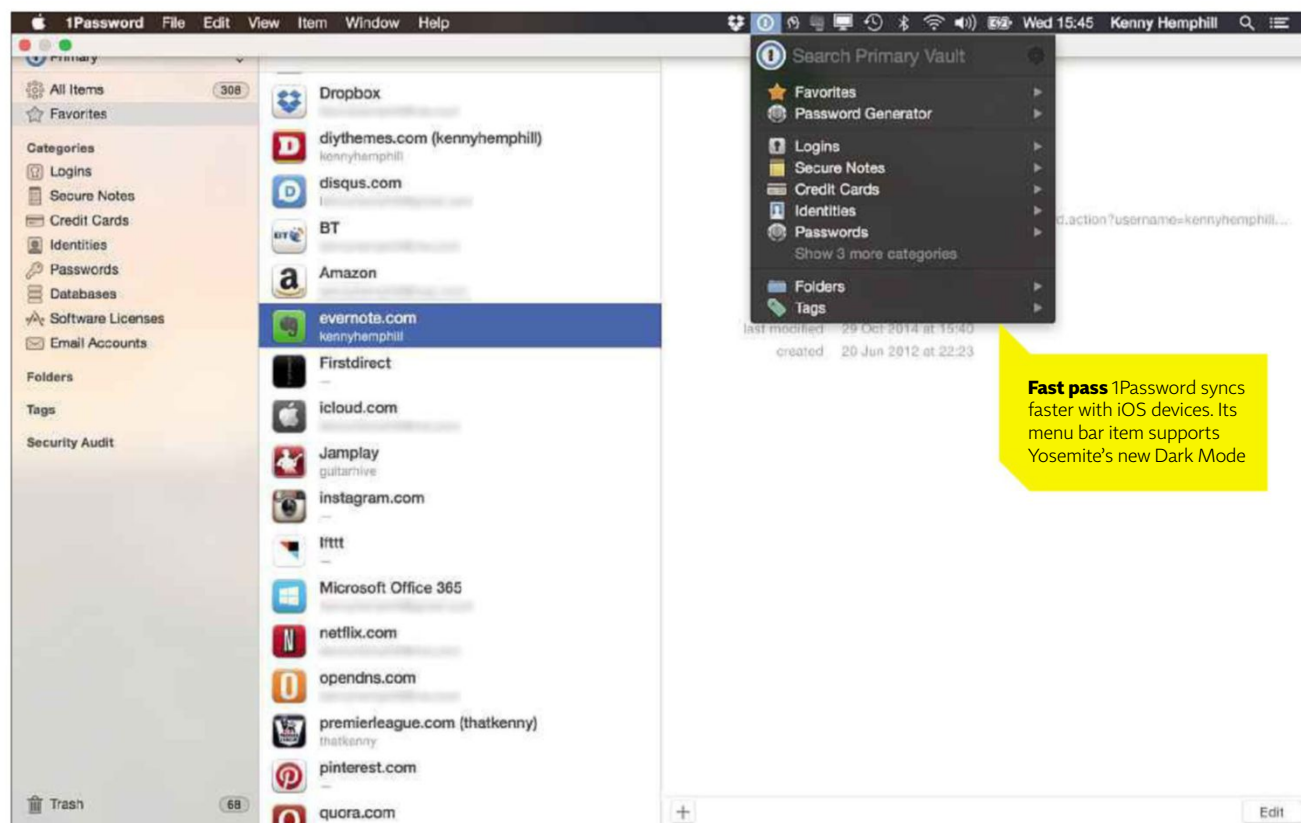
Password managers are fast becoming essential. If you need to use yours between Mac and iOS, 1Password remains, for us, the pick of the crop. KENNY HEMPHILL



Password manager for the Mac  
See [agilebits.com](http://agilebits.com)

**£24.49** from the Mac App Store

Requires OS X 10.10 or later, 64-bit processor



# noidentity Next



OS X

Our empirical evidence suggests that simpler personal finance apps tend to be used more than those with long feature lists. If this is true, noidentity's Next should earn a permanent place in your Mac's Dock. This is an app that redefines personal finance minimalism. It doesn't even track income, only expenses – but it does that one task very well indeed.

Single-windowed and button-heavy, Next's iPhone heritage is clear. The main calendar view can be shown in monthly or annual time frames. To track an expense, you click a button next to a date, enter the amount in a field in a floating palette, assign it to one of 27 expense categories by selecting the matching icon and optionally enter an explanatory note.

There are lovely interface touches. As you scrub through dates in month view, an overlaid line chart illustrates daily expend-

iture so you can see when you're spending most heavily. And when entering an expense, the icons of commonly used categories appear darker to help identify them.

Two outstanding features are automatic iCloud syncing – no fiddling with preferences to share data with Next's sister iOS apps – and a decent export function that transfers your data, or that of a selected period, in Excel format, with expenses neatly arranged by category in the exported file.

There isn't much in the way of analysis tools, but clicking a small icon next to annual or monthly calendars displays a bar chart showing spending by category in a particular month or year.

The list of things Next doesn't do is longer than the list of those it does. You can't import data, split transactions between categories or budget for future expenses. But their absence is clearly a conscious

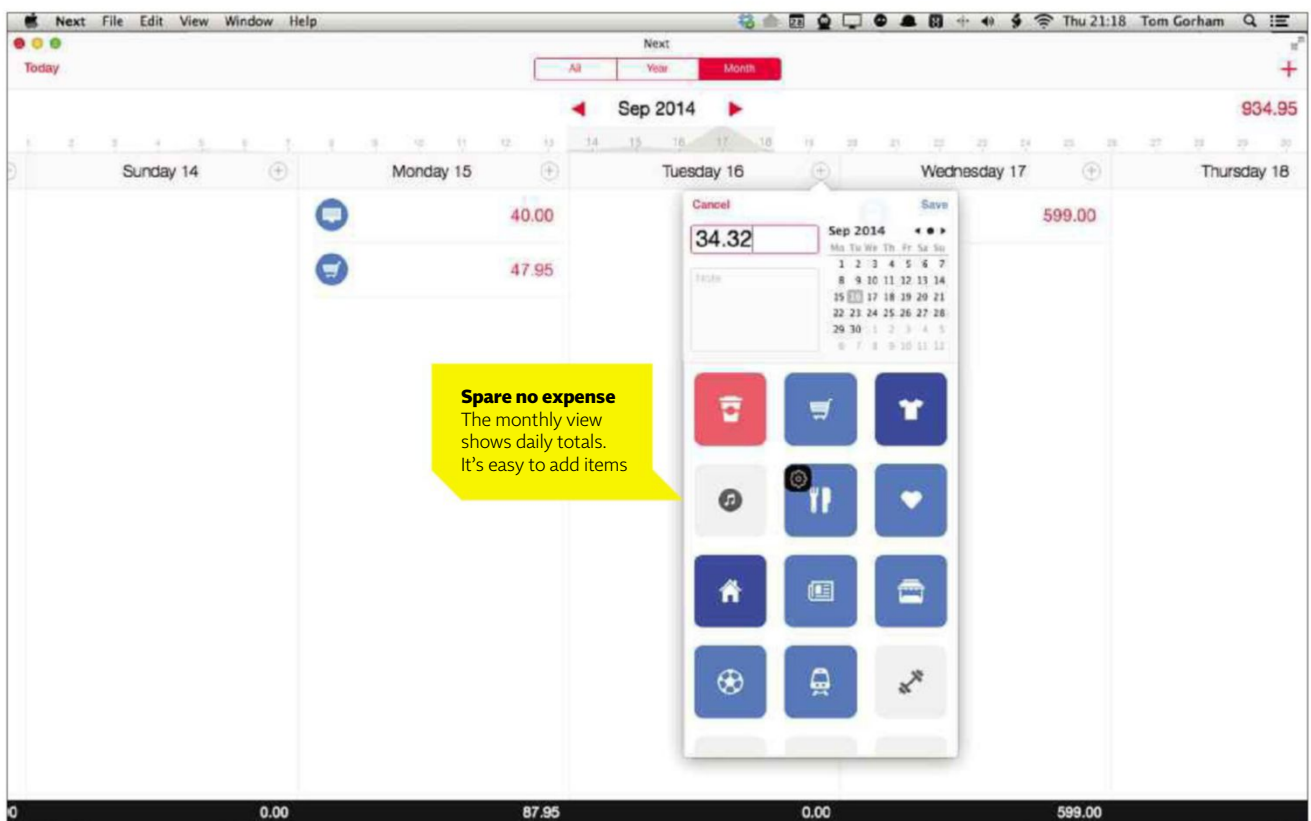
choice. Less understandable is its inability to set up recurring expenses, which means tracking regular outgoings is more troublesome than it should be.

The interface doesn't work as smoothly as it does on the iPhone. Scrolling through a fixed-length window to find a category icon isn't as easy on the Mac's non-touchscreen. Instead, we'd have liked to be able to type in category names (you can't create your own icons) or have notes auto-complete based on previous entries.

But if Next sacrifices some basic functions to be the neatest, simplest personal finance app around, it's a trade-off that in the main pays off. **TOM GORHAM**



Personal finance app for the Mac  
See [noidentity.com/next.html](http://noidentity.com/next.html)  
**£4.99** from the Mac App Store  
Requires OS X 10.9 or later, 64-bit processor





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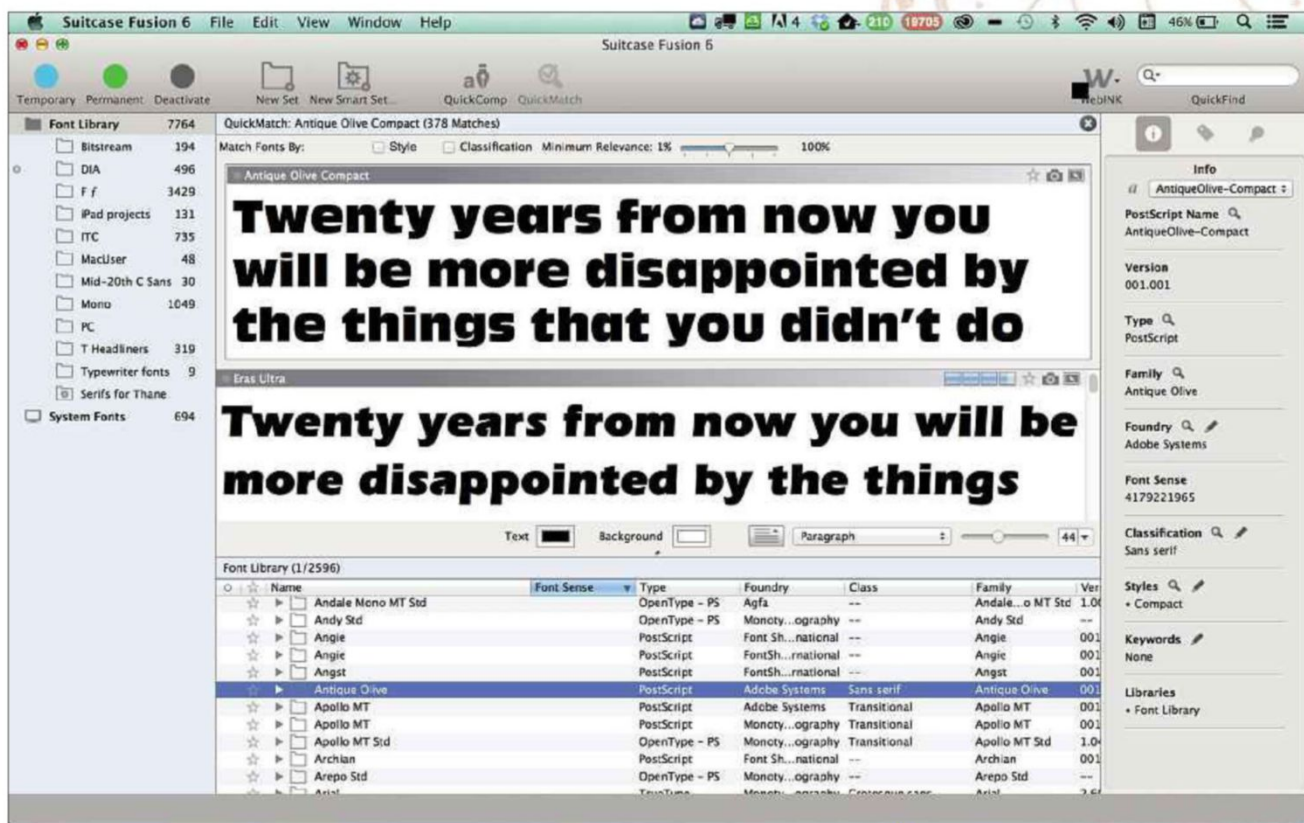
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## Extensis Suitcase Fusion 6

### Strike a match

Select a font and  
Suitcase will find  
a similar one



Designers love fonts. According to Extensis, the average designer's font collection weighs in at around 4,500 faces and styles, and many are much, much larger than that. If you're nodding in recognition, you need software to help manage things. Could Extensis Suitcase Fusion 6 be the answer?

Getting the basics out of the way first, this version is fully compatible with Yosemite and is optimised for Retina displays, and it's capable of handling font libraries larger than anyone ought to own.

Drop your font collections into the Suitcase window and it'll add the contents to its 'font vault' and list everything in its main window, searchable and sortable by a range of criteria including foundry, classification and style, as well as name. As fonts are added, they're scanned for problems from missing parts to corrupted files, helping you avoid trouble.

You can create font sets, so you can enable or disable whole groups of fonts at once. The Smart Set option works like iTunes' Smart Playlists, searching for fonts that match nominated criteria. Smart searches for classifications are limited to the beginning of class names, so 'serif' won't find 'sans serif' – sensible, as you can see, but it can be confusing at first.

Once Suitcase has your fonts under its care, it can auto-open any typeface used in most kinds of documents. The key professional publishing apps – Adobe InDesign, Illustrator and Photoshop, and QuarkXPress – get plug-ins to help them work seamlessly with Suitcase, but it will also automatically activate fonts required by documents in the majority of other apps as well.

Curiously, on the right-hand side of the Suitcase window there's a scrolling list of 'Fontspiration'

images, designers' blockbusting typographic layouts drawn from the Extensis Tumblr account. This can be hidden if it irks you.

Suitcase is in the cloud game now: font vaults – whole collections, not individual sets – can be archived to Dropbox, Google Drive or any folder. You can link to Google Fonts for web-based font access, and you can also use the similar Extensis WebInk, although that's closing next summer.

Minor quirks aside, Suitcase Fusion 6 is mature and fully featured, to the point where it's hard to see what more it could offer. The bottom line is plain: if you have a lot of fonts, this will make your life a lot easier. KEITH MARTIN



Font management utility for the Mac  
See [extensis.com/suitcase-fusion](http://extensis.com/suitcase-fusion)  
£76 (\$120) from [extensis.com](http://extensis.com)  
Requires OS X 10.6.8 or later



**Instant movie** Shoot video in-app and use the Storyboard and timeline views to build a project

**Control surface** Tap a clip to show sliders for orientation, speed, volume and more

**Box office** You can export video or raw project data. Rendering is slow on older phones

## Corel Pinnacle Studio for iPhone



The Pinnacle name has a long history in the video market, attached to products aimed at everyone from consumer to broadcast. Once owned by Avid, it's now part of Corel, which relaunched Avid Studio for iPad in 2012 as Pinnacle Studio. Now it's come to the iPhone too, for those who want to be able to make movies in their pocket, so to speak.

The app runs on the iPhone 4 or higher, though ideally you'll want a dual-core model for better performance, meaning at least a 4s, which is what we used for testing. It's good to see an ambitious app supporting older hardware.

The obvious question is why you'd pay £6.99 for a video editing app when iMovie is free with a new

iPhone, or £2.99 for an old one. The answer is that it has more features and is designed to give you more control.

Begin a new project and you can set a frame rate and either start from scratch or import a project from iTunes, Box (a cloud service similar to Dropbox), Skoletube or Bornetube (no, me neither). You can access your local Camera Roll or shoot video and stills within the app. Your iPhone's music library is available too for soundtracking (copyright permitting), and there's a built-in voice recorder to capture from the built-in mic or a connected unit to an audio track.

Pinnacle works in both portrait and landscape modes, and you'll find yourself switching between

these, because certain tasks suit different orientations. Tap any clip to open it and set in and out points, then insert it into the timeline; or drop it straight in, then edit its edges, move or split it with the Cut tool, or replace it with another clip. You can control a clip's length with a key shortcut.

There are two timeline views: a Storyboard and a regular linear video/audio track view. Storyboard (which can be hidden if you prefer) gives you a block-by-block view of the project's content regardless of its duration, so it's easier to see an overview, though not its length. The regular timeline view can be zoomed in or out by pinching at the base of the screen, and navigating is pretty easy thanks to





**Drag act** Features like themes, titling and transitions can be dropped into place



**Turnaround** A lot of functionality is crammed in, but it works. Rotate the phone for a different view

snapping. Using an app this capable on a phone screen does require a degree of care with your fingers, of course, and though it's been well thought out it's still possible to drag something to the wrong place or perpetrate something else unintended if you're not paying close enough attention.

There are 16 transitions to choose from – fades, pushes and slides – and these can be dropped between clips and resized like other content using handles. You can tap on most clip types in the timeline to open a sort of properties window that lets you change parameters such as orientation, fit, speed, volume and audio fades.

In the case of the animated themes available, the control

section lets you choose background and secondary images or videos plus their orientation and the speed of the animation. You can also apply a picture-in-picture effect. Last but not least is titling, nicely implemented with a selection of ready-made static and motion templates.

When your project is finished, it can be rendered (at up to 1080p with high frame rate support) to a movie file saved to the Camera Roll, sent to YouTube, Facebook or Box, or transferred as a raw project plus media via iTunes or Box for further work on another iOS device or in Pinnacle Studio for Windows.

The big catch here is that Corel doesn't have a Mac version, so if you want a workflow where you

rough-cut on the iPhone and then switch to desktop, you'll have to look at something like the less capable new Adobe Premiere Clip, which can transfer projects seamlessly to the Mac app. You can at least shift work to iPad if it helps.

It's hard to see anyone choosing a phone as their primary edit suite, but the app is handy and much more capable than you might think. It may not look as glossy as iMovie, but Pinnacle is more flexible, and capable of some commendable results. **HOLLIN JONES**



Video editing app for iPhone  
See [pinnaclesys.com](http://pinnaclesys.com)  
**£6.99** from the App Store  
Requires iPhone 4 or higher

*Always tested by hand  
and rated by experts*



## UAB Pixelmator Team Pixelmator for iPad

**Take it all in** Layers show as thumbnails down the left-hand side, and filters appear in a scrolling footer



iOS

On the Mac, Pixelmator is known for its quirky interface and novel range of filters. Oh, let's just say it: it's the photo editor for hipsters. Now that the long-awaited iPad version has arrived, how well does it measure up to the hype?

Like its big bro, Pixelmator can combine multiple images, perform adjustments, create cutouts and add a wide variety of special effects. It eschews the familiar toolbar interface to present a clear, uncluttered image editing area in which panels are shown only when they're needed. Tap at the top to bring down the menu bar; tap on the left to see thumbnails of all the layers in your document.

This does mean it can be hard to locate some features. Tapping

the paintbrush icon opens a menu from which you can choose paint and erase tools, retouch tools, colour adjustments, effects, selection tools and cropping tools. Picking one of these fills the screen with a set of huge icons showing the tools in each category, with a few words of explanatory text for each. It's a novel approach, but when you just want to switch tool, it feels like two unnecessary steps.

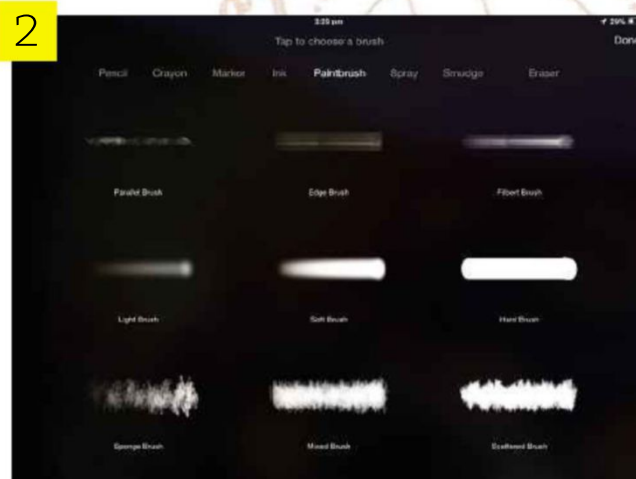
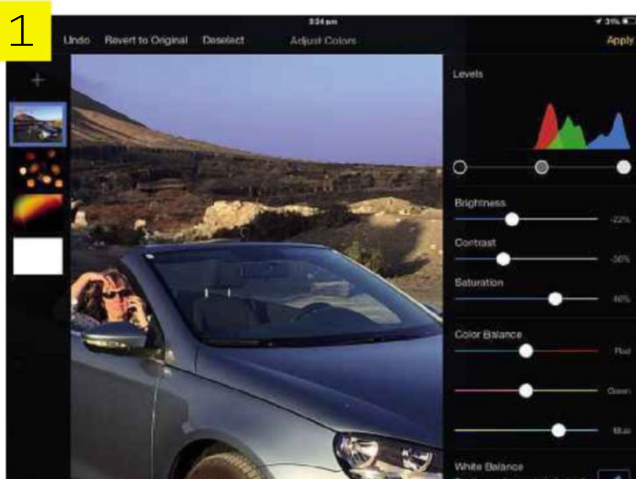
The selection tools are weak. As well as the traditional Marquee, Ellipse and Lasso, there's only the Magic Wand for making colour-based selections. It's tricky to use, since you have to drag to increase the tolerance; and the Lasso is the only way to modify selections. Unlike with Photoshop

Touch, you can't offset the cursor, so your finger obscures the area you're trying to select. And painting tools lack any indication of their size before you start to paint.

The range of special effect filters include many visual novelties, from kaleidoscopes to distortions. There's also a set of 'light leaks', which add flare-like effects. Bizarrely, you can't apply these to empty layers, so if you want to be able to move or adjust the effect later, you'll need to first make a black layer, then set its mode to Screen, and then apply the filter to that. It's unnecessarily fiddly.

Image adjustments include curves, levels, colour balance and white balance. Rather conveniently, they all appear together in a scroll-





ing side panel, so you can adjust them in tandem before committing to the final effect. Other tools have been less well thought out: to rotate a layer, you place two fingers on it and twist, but if you don't twist straight away, or don't place your fingers at exactly the same time, no rotation will happen.

Pixelmator is still as quirky, and largely as entertaining, as its desktop version. We see the appeal, but if you really want to adjust images and create montages, use Photoshop Touch. STEVE CAPLIN



Photo editing app for the iPad  
See [pixelmator.com](http://pixelmator.com)  
£2.99 from the Mac App Store  
Requires iOS 8

**1 ADJUST EVERYTHING** Having all the adjustments presented in a single panel makes it that much easier to get the effect you want before committing to any one change. These tools are well designed, and the ability to use them in tandem in this way is a major bonus.

**3 BRUSH SIZE** You have five choices of brush size, from Very Small to Very Large, as well as an opacity slider. However, there's no on-screen cursor, which means that if you use an eraser, you're using it blind: you have little idea what's going to be erased until it's gone.

**2 BRUSH CHOICE** Choose tools and brushes from a huge visual menu that fills the screen. It makes the process of choosing easier the first time you use it, but thereafter it means that a task as simple as changing tools involves several steps rather than just one.

**4 LAYER EFFECTS** Effects such as shadows are applied using a simple panel, but the effects don't always show up until after you've exited the dialog, and the sliders are fiddly and clumsy to use with any accuracy. With no way to adjust the values numerically, it takes pixel precision to make a small adjustment.

# Alesis iO Dock II



The purpose of an iPad dock is to record audio and MIDI into an iPad with some of the same connectivity you'd get from a pro audio interface, but without adaptors and cables – or a computer. It's a great idea: Apple's processors are sufficiently powerful and apps are getting competent enough for you to record and produce all the way on iPad, although there are obviously limitations compared to a desktop or laptop-based system.

Alesis was one of the first to release such a dock, and was much praised for bringing pro-level connectivity to the iPad. Now it's back with the iO Dock II, a similar-looking device but with a few changes. The most obvious is that it now supports both the older 30-pin Dock connector and Lightning – but with a catch, of which more in a moment. You get both kinds of adaptor in the box, and can swap them – but don't lose them.

The iO Dock II holds your iPad securely while you work, and here comes the first problem. Physically, it supports iPad models 1 to 4, but not the Air or Air 2 and none of the minis. In fact you can connect these other models, but they won't be held in place, which is significant when you interface with something by touching it. The supported models are accommodated using a tray system to cope with their different depths, so in principle there could be a tray for the Air, Air 2 or mini – but so far there isn't.

Assuming you have the right kind of iPad, it can interface seamlessly with the hardware port: there are combo XLR/jack inputs with phantom power and gain, a mic/line switch, stereo outputs, a direct monitoring switch and a foot switch input for triggering recording with an optional pedal. On one side there's a headphone out with gain control, and on the

other 1 × 1 MIDI in/out and a USB MIDI port. The inclusion of old-style MIDI ports means you can hook up your hardware synths and drum machines to be triggered by your iPad sequencer. The USB port carries MIDI data but not power, so any controllers will have to be powered separately, unfortunately.

The iO Dock II is cheaper than the iTrack Dock, and has hardware MIDI ports which the iTrack doesn't, but the lack of support for new iPads makes it dated. An increasing number of pro audio interfaces are going 'universal', with support for Mac, PC and iOS built-in, so there's more choice than ever for iPad-owning musicians looking for docks. LABS TEAM



Audio/MIDI dock for iPad  
See [alesis.com](http://alesis.com)  
**£129** from PC World  
Requires iPad 1, 2, 3 or 4

**Old school**  
MIDI ports let you hook up legacy synths

**Low pass** Only older iPads are compatible with the iO Dock II

**Twin track**  
XLR/TRS jacks cater for all kinds of mics





Always tested by hand experts



Instant  
studio,  
just add  
iPad

## Focusrite iTrack Dock



iOS

Focusrite has gone for a Lightning-only solution, supporting the iPad 4, Air and mini models but nothing earlier. iPad Air 2 compatibility wasn't confirmed at the time of writing, but there's no obvious reason why it would be a problem. The Lightning connector can be moved up or down to suit the size of your iPad; the mini sits more or less flush, while full-size models stick out but are still held securely.

The Dock also powers and charges your iPad and passes all the signals from its various ports to the Lightning bus. With Core Audio and CoreMIDI built into

iOS, the box's audio and MIDI (via USB) ports appear automatically to the apps you run.

On the back are two inputs, each with an XLR and alternative line input and switchable phantom power for condenser mics. Two monitor outs can be connected to a set of powered speakers or a mixing desk, and a female USB MIDI port carries data and power; you can hook up class-compliant controller devices like keyboards or drum pads to this.

The front panel has a big friendly monitor knob and gain knobs for the two audio ins, with

the 'halo' level display system whereby signal is shown as green, clipping as red light. There's a direct monitoring button that feeds your signal back to you before it's passed to the iPad, eliminating latency when recording from a mic or guitar.

The iTrack Dock is a solid way to record in full quality and hook up pro mics, speakers and MIDI controllers to your iPad. I/O is limited, of course, but most iPad users won't be recording more than a couple of tracks at once. Uncluttered, it's easy to use and gives great results with more capable iOS DAWs like GarageBand, Cubasis or Auria. LABS TEAM



Audio/MIDI dock for iPad  
See [focusrite.com](http://focusrite.com)  
£169 from [amazon.co.uk](http://amazon.co.uk)  
Requires iPad 4 or later





## LG 34UM95

*Bright,  
beautiful,  
and very,  
very wide*



OS X

The ultra-wide 34in LG 34UM95 has a resolution of 3440 × 1440 pixels, which used to seem a lot before the 5K iMac arrived. It's not Retina, of course, but a conventional big screen with extra space horizontally, making it ideal for tasks such as video editing. It will also appeal to gamers wanting a wider field of view for those titles that support its aspect ratio.

The relatively low vertical resolution means the total pixel count is still manageable, so most recent Macs will be able to drive it.

The design, though plasticky, is spot-on, with very slim bezels, a shiny silver coating and a transparent stand. We won't mark the stand down for its lack of height adjustment, since Apple doesn't offer this either – but Apple's screens don't wobble. This does.

The 34UM95's IPS panel provides an excellent mix of colour accuracy, contrast and black levels.

By default, the monitor was able to display 96.7% of the sRGB colour gamut, and with a little calibration we increased coverage to a near-perfect 99.8%. sRGB is a consumer standard, and graphics pros may still want more, but this is very good for a general purpose screen.

Subjectively, the image quality is fantastic. Images looked alive with colour, and the measured 1062:1 contrast ratio combined with low black levels of 0.21cd/m<sup>2</sup> made for a very pleasing, deep image. Movies in wider aspect ratios such as 2.39:1 looked great, despite around an inch of black space either side of the screen.

For work, the IPS panel has a matt coating, a welcome change from Apple's shiny screens.

On the back, impressively, are two Thunderbolt 2 ports, and a USB hub providing one USB 3 and two USB 2 sockets. Thunderbolt or the full-size DisplayPort connector

will be your preferred video input, because the HDMI port is limited to a 50Hz refresh rate, which we found noticeably less smooth.

A picture-by-picture mode lets you show inputs from two computers side by side. This didn't work well for us, though, because the two displays were both squashed into an odd aspect ratio, making them impractical to use.

Despite some quirks, the 34UM95 is a superb ultra-wide display. Its high-resolution IPS screen is one of the most visually pleasing we've seen. The only caveat is that decent 27in screens are so cheap now that its price limits it to users who really want the wide format. **LABS TEAM**



34in 21:9 ultra-wide IPS display  
See [lg.com/uk](http://lg.com/uk)

**£720** from [overclockers.co.uk](http://overclockers.co.uk)  
3440×1440, Thunderbolt 2, anti-glare screen



# Light Harmonic Geek Out DAC 450



OS X

If you're looking for a digital headphone amp for your Mac, you have a number of options. The latest is Light Harmonic's Geek Out DAC 450, which the company says crams the same tech used in its £20,000 desktop DACs into a USB stick.

Some stick: the unit is about the size of a large USB drive, encased in aluminium. It provides two outputs: one for high-impedance cans (up to 60 ohms), which can also act as an output for line-level inputs; and one low-impedance jack for your earbuds.

On the side are two buttons that control volume, and on top seven status LEDs. The build quality of our sample was fair, but no better than that. The volume buttons felt loose and rattled when we touched them, and the USB plug didn't feel secure in our MacBook Pro's socket. In addition, as Light Harmonics warns in the manual, the box gets very hot – up to 70°C.

The Geek Out has support for a sample rates up to 384kHz at 32-bit, and will decode any audio file your Mac can throw at it. That sampling rate sounds impressive compared with competitors such as TEAC's HA-P50 (p111, MacUser, August 2014, £2.70 from bit.ly/macuser3008), which tops out at 96kHz and 24-bit. Whether your ear can resolve frequencies even as high as 96kHz, however, is a moot point. And even if it can, getting hold of music recorded at 384kHz is really quite difficult.

But we did find some DSD files (the format used for Super Audio CD; the Geek Out supports DSD64 and DSD128) at 384kHz/32-bit and tested them by playing them using the Audirvana Plus player. They sounded as stunning and immersive as anything we've ever heard from a digital recording.

Playing a handful of ultra-high-resolution files isn't a good reason

for most of us to fork out for a DAC. So we hooked up iTunes and played 44.1kHz/16-bit files instead. And the improvement in those files between the Mac's headphone jack and the Geek Out was huge. Mushy strings became bright and precise; whispered vocals were clearly audible. The music demanded to be listened to rather than just heard.

The Geek Out 450 has one more trick up its sleeve, a DSP treatment Light Harmonic calls '3D Awesomification.' It's subtle, but does widen the sound stage.

Concerns about build quality aside, the Geek Out DAC 450 is very good, and at £199, well worth considering. KENNY HEMPHILL



Digital headphone amp for the Mac  
See [lhlab.com](http://lhlab.com)  
£199 from [anthemav.com](http://anthemav.com)  
Requires headphones



#### Music to your ears

The Geek Out makes a huge difference to the quality of audio output



*Colour  
lasers,  
watch your  
backs*



## Epson WorkForce Pro WF-5620DWF



OS X



iOS



Best  
Value

Epson's WorkForce Pro WF-5620DWF inkjet is a serious alternative to a laser all-in-one. For starters, it costs as little as an entry-level colour laser all-in-one, but it has much more advanced features. It supports wired and wireless networks, duplex prints, scans, copies and faxes.

An obvious highlight is the colour touchscreen. The display is crisp and responsive, and the menu system intuitive, but there are still physical buttons for entering numbers and starting photocopies.

This is a very fast inkjet, reaching 19.2ppm over our 25-page text test, and 13.1ppm on our more demanding colour graphics document – only a little slower than an equivalent laser printer. Draft quality printing is no quicker, however, and duplex speeds weren't as impressive: printing ten colour sides onto five sheets took one minute and 39 seconds.

Photocopies were swift, particularly for single sheets, which took eight seconds to copy in mono and 14 seconds in colour. Over multi-page copies, the printer lagged behind its 35-page automatic document feeder (ADF), with a ten-page colour copy taking three minutes 43 seconds. The scanner completed an A4 preview in just six seconds and scanned a page at 300dpi in 14 seconds.

Fortunately, this impressive speed is matched by good quality. While not quite laser-sharp, black text was dark and crisp, with no obvious spidering or stepping. Colour graphics were strong and equally free of artefacts, although duplex prints were slightly fainter – a result of the printer reducing ink use to prevent smearing.

Scans had good colour accuracy and were reasonably sharp. However, we noticed that some colour boundaries seemed slightly

blocky, as though they'd been gently enhanced.

The WF-5620DWF is a match for the speed and quality of an entry-level colour laser MFP, but on running costs it's far ahead. Epson offers regular, XL and XXL refills, with the latter good for 4,000 pages. At the time of writing, these barely offered any savings over the XL-sized consumable, with costs working out at about 1p for the black component of a full-colour page and 3.3p for colour. But that's still two to three times cheaper than most equivalent lasers.

Combining great features, low costs and solid performance, this excellent office all-in-one makes the case against lasers. LABS TEAM



Wireless inkjet all-in-one  
See [epson.co.uk](http://epson.co.uk)  
**£218** from dabs.com  
Requires OS X 10.5.8 or later



# Canon PIXMA MG6450



OS X



iOS

Canon's PIXMA MG6450 is a mid-range all-in-one printer/scanner with a bias towards creative home use. It replaces the MG6350, the most obvious difference being that this model is slightly cheaper and is available in black, white or a strange metallic plum colour.

There's no fax modem or automatic document feeder, but it does support duplex printing, is wireless and supports AirPrint for printing directly from your iOS devices. Further direct printing and scanning options take advantage of the built-in memory card slot and 7.5cm colour screen.

It's a sleek-looking machine, but this comes at the expense of practicality. Access to the print heads and ink cartridges is via a narrow slot accessed by lifting up the entire control panel section; it's neat, but it can be hard to get cartridges lined up properly at the rear. Meanwhile, the MG6450's

screen and directional button controls are a little less elegant and intuitive than the previous model's touchscreen.

We were disappointed with paper handling. The single paper tray appears to be captive in the base of the printer. The front panel has to be kept open when it's loaded with A4 paper, which could allow dust onto the stack.

It's not all bad, fortunately. Text printing was quite quick, reaching 13.3 pages per minute, while it managed 3.7ppm in our challenging colour business document test. Photo printing was also swift, delivering a photo every two minutes at the highest possible quality. Scans became quite slow over wifi at higher quality settings – it performed better when we switched to USB.

Scans and prints were excellent, with accurate colours, sharp detailing and convincingly repro-

duced contrast and shading even in the lightest and darkest regions. Mono text was pin-sharp across the range of font sizes we test.

The MG6450 accepts high-capacity versions of all five ink tanks, which include both dye-based black for photo printing and pigmented black for sharp mono text on standard paper. The support for high-capacity cartridges means that mono running costs are a reasonable 2.3p per page, and colour costs are low at 5.1p.

It's a great all-in-one, but if its comparatively high price and basic paper handling put you off, consider the slightly cheaper PIXMA MG5550, which only comes in black. LABS TEAM



Wireless inkjet photo all-in-one  
See [canon.co.uk](http://canon.co.uk)

**£89.99** from PC World

Requires OS X 10.6.8 or later, supports AirPrint



**Pretty face** The MG6450 looks good, but there are some ergonomic niggles









The compact with lots of lenses

## Fujifilm X-M1

The X-M1 is the entry-level model in Fujifilm's X Mount compact system camera (CSC) range. The company has a knack for designing truly luxurious compacts, and like its siblings, the X-M1 has 16 megapixel sensor and a pleasingly retro design. On the downside, its body is plastic rather than aluminium, and it lacks a viewfinder or dials for controlling shutter speed, aperture and exposure compensation. It's also bulky for a CSC.

The wifi implementation is relatively simple, with no remote shooting function. Transfers are managed either on the camera or a connected iOS device, with an option to resize photos to 3 megapixels before transfer. Rather than using a password, the connected device must be confirmed by clicking OK on the camera. We got numerous Not Found messages before we got the camera, app and iPad's Network Settings to work together at the same time.

The app can also use the iPhone's GPS to geotag photos. Rather than keeping a log, though, the app and camera must be synced manually each time you want to update the GPS position.

Taking photos was a pleasant experience. The controls are well laid out, with dedicated buttons for autofocus point, white balance, drive mode and ISO speed (the

latter being the default for the customisable Fn button). Meanwhile, pressing the Q button reveals a grid of 15 functions on the screen, navigated using the rear pad and adjusted with either command dial.

Having dual dials pays off in priority and manual exposure modes, giving direct access to exposure settings. The dial on the top plate is easily adjusted by accident, though. The sharp 3in screen tilts up and down by 90° for waist-height or overhead shooting, but not all the way over for self-portraits. We'd have preferred a touchscreen for quicker navigation of the Q menu and autofocus point adjustment, but the rear pad handles these tasks reasonably quickly.

We noticed some odd behaviour during our tests. At one point, the camera complained it had run out of numbers to assign to photos, and refused to take any more until we reset the numbering system. Fujifilm says this is to avoid having photos with duplicate file names, but stopping taking photos altogether doesn't seem like a practical solution. Why not just use longer file names?

Autofocus was responsive, taking less than half a second to lock onto subjects. We measured one second between shots in normal use – a respectable result, but half the speed of the fastest

CSCs. It fared better in continuous mode, capturing 42 frames at 5.5fps before slowing slightly to 4.4fps. Raw capture lasted for 11 frames before slowing to 1.4fps.

The X-M1 has a dedicated video record button. Videos are recorded at 1080p at 30fps with stereo sound, and the 37Mbit/sec bit rate keeps compression artefacts at bay. However, picture quality was undermined by aliasing artefacts. Not a camera for keen videographers, then, but fine for casual clips.

It's hard to imagine anyone being disappointed by the X-M1's stills quality. JPEGs showed the kind of detail and dynamic range you normally only get with raw. Noise levels were lower than from any cropped-sensor SLR we've seen, and closer to full-frame SLRs. It's a phenomenal achievement.

12 lenses are due to be available, but they're not cheap for this class of camera: the eight currently on sale range from £380 to £700. In all, we like the X-M1, with its pleasing design and superb image quality – but if you actually want to change the lens, it moves into a different price bracket. LABS TEAM



16-megapixel compact system camera  
See [fujifilm.eu/uk](http://fujifilm.eu/uk)  
£389 with 16-50mm kit lens from [jessops.com](http://jessops.com)  
3.1x zoom, 3in articulated screen, raw mode



OS X



iOS

# Gmobi iStick

*Copy  
files onto  
and off  
your iOS  
devices*



OS X



iOS

Based on the USB On-The-Go protocol, this is the first memory drive for iOS that supports two-way communication, so not only can you open files directly from it or copy them to your device's storage, but you can also copy files from the device to the iStick. This sounds handy, not least for offloading photos and videos shot with the device, which you can then delete to make space. Capacities range from 8 to 128GB.

The Apple MFi-certified thumb drive is wide and flat, like an oversized Lightning to 30-pin adaptor. It comes in matt white or gloss black plastic or, at extra cost, aluminium. Lightning and USB ports are mounted at either end of a slider. Plug the USB end into your Mac or PC (holding on to the slider so that it doesn't retract) and the flash memory shows up as a drive in the Finder, so you can drag files on and off at will.

Plug the Lightning end into your iOS device and nothing happens, but having downloaded and opened the iStick app you can then browse the storage within it. Also in the box is a Lightning extension cable, in case your device has a cover that blocks the iStick. This looks a bit home-made, but works.

The iStick originated with a million-dollar Kickstarter campaign by Silicon Valley company Sanho, known for its HYPER accessories, but is manufactured by PQI in Taiwan. This is reflected in some

oddly stilted user interface text. 'Return' is used to mean 'Back', and tapping the icon to format the iStick gives the charming alert: 'It's will erase all data, are you sure to format external accessory?'

Clunky as it is, the app is simple to use. You can open file listings for your iOS Photo Library, the iStick itself, and a folder structure provided within the app for files copied from the iStick to your device, labelled 'iPhone' on our iPhone 6. In each case, you can then select files and copy them to one of the other two locations, or delete them.

An obvious omission is any link to iCloud Drive or Dropbox, which you might want to copy documents to or from. There's no way to get tracks into the Music app or videos into Videos; that prerogative is reserved for iTunes. But you can add photos to your Camera Roll and PDFs to iBooks. A fair range of file formats is supported, including most audio and video files, Microsoft Office and iWork.

The big limitation becomes obvious when you look in the iPhone folder and realise all the subfolders, though helpfully predefined with names like 'Documents' and 'Music', are completely empty, no matter how much stuff is stored on your iPhone.

To get an item to appear here, you have to go to an app, select a document, tap the Share button, pick 'Open in another app' (or the

equivalent) and select iStick as the app. Returning to the iStick app, you'll find the copied item (the original still remains within its own app's storage allocation) in the Inbox subfolder, from where you can move it to a more appropriate place, which takes another five taps. Not all apps even support this; you can't move iTunes purchases from the Music or Videos apps, for example.

In short, transferring files from your device's Photo Library to the iStick is simple, but from anywhere else it's a fuss at best. And although the Photo Library folder in the iStick app offers a Select All option, you can only move files here, not delete them; so after copying a batch of photos to your iStick, you're stuck for a way to delete them from the device, other than tapping them one by one in the Photos app.

Before iCloud, iStick might have seemed a life-saver. Today, it's beneficial in a relatively narrow range of circumstances, and the file management limitations imposed by iOS weigh heavily on its convenience. But you may well see a use for it, especially if transferring photos is particularly relevant. ADAM BANKS



Flash memory drive for iOS  
**From £61** (\$97 including shipping) for 8GB  
from [hypershops.com](http://hypershops.com)  
For supported file formats, see [bit.ly/istickff](http://bit.ly/istickff)



# Penclic R2 Wireless Mouse



Mouse, trackpad, tablet, touch-screen – there's a limited number of established ways to translate your intention to a computer through your hand. But new ideas are always welcome. HP's new Sprout PC combines a touch-sensitive mat with a projector to let you work directly with 2D and 3D objects. Less ambitious but nonetheless interesting is the Penclic, a brand new input device that crosses a stylus with a mouse.

The Penclic comes in a posh-looking plastic bell jar with a tiny multilingual manual that contains no instructions. Also included is a micro USB charging cable on a spring-loaded reel, a clever little thing that looks very handy to pop in a bag without tangling.

Plugging this in didn't actually seem to charge the Penclic until our third attempt, and pairing it (via Bluetooth) with our Mac was plagued by drop-outs. We never got to the bottom of this, but still, when it worked it worked.

The Penclic consists of a stylus, similar in form to those supplied with graphics tablets, mounted with a ball joint on a match-box-sized plastic base. It looks like a joystick, but isn't one: the ball joint is only there so that you can hold the pen at whatever angle you find comfortable. Gripping this, you then push the base around your mouse mat.

It seems ridiculous when you first try it, but the feeling is actually quite natural, even pleasant. The action is sufficiently different from using a mouse that it may be worth considering if you've had problems with RSI, or just feel like you need a change.

Unfortunately, the Penclic's value to Mac users is limited by the omission of setup software. It takes over the cursor when plugged in, but that's it; OS X's System Preferences has little clue what to do with it. While the

Tracking Speed option correctly adjusts how fast it moves the cursor, Set Up Bluetooth Mouse just ignores it, and there's no way to activate the various buttons beyond left- and right-click.

Clicking isn't easy, either. You can reach them comfortably as long as you hold the shaft right at the base, but pressing them means subtly adjusting the grip you need to move the device around. Getting to the scroll wheel, mounted at the right of the base, seems to require a different grip again. Practice would no doubt help, but a normal mouse felt much more relaxed.

We set ourselves some drawing tasks to see if the Penclic was more controllable than the Magic

Mouse. It wasn't; in fact, it made fine control harder and translated more hand shake into jittery lines. Unlike a graphics tablet stylus, it's no good for tracing, either.

There's a new third-generation version of the Penclic with the scroll wheel on the central shaft and fewer buttons, which looks like a better choice for Mac users, and its corded option would get over our Bluetooth issues. But, based on the model tested, we think there are too many flaws. If you get chance to try one, do – it's intriguing to see how input could be different. ADAM BANKS

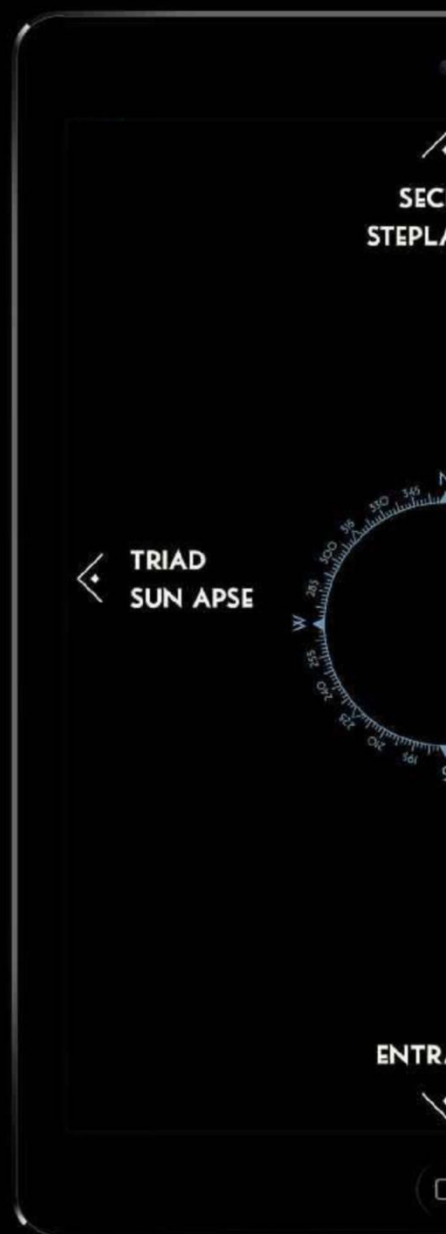


'Ergonomic' mouse alternative  
See [Penclic.se](http://Penclic.se)

**£89.95** from [healthyworkstations.com](http://healthyworkstations.com)  
Bluetooth (wired version available)



**Mightier?** The pen/mouse hybrid is a lovely idea, but deeply flawed



## Simogo *The Sailor's Dream*

**Sail** In the circular sea you'll find a small number of mysterious buildings to explore



iOS

Simogo started out making quirky iOS arcade titles, but last year began experimenting with the form of gaming and storytelling. *Year Walk* was a point-and-click adventure masquerading as a horror novella, immersing you in chilling Scandinavian folklore. *Device 6* was a Prisoner-style techno-mystery draped over the framework of a puzzle game; the story's words became the map that you explored.

*The Sailor's Dream* continues to deconstruct and fragment a narrative and peel back the layers of gaming conventions until what remains is a tiny world of dream-like slivers. Snatches of narrative and memories are peppered throughout as half-heard ghostly audio, texts and broadcasts; corridors between environments become dotted lines in darkness.

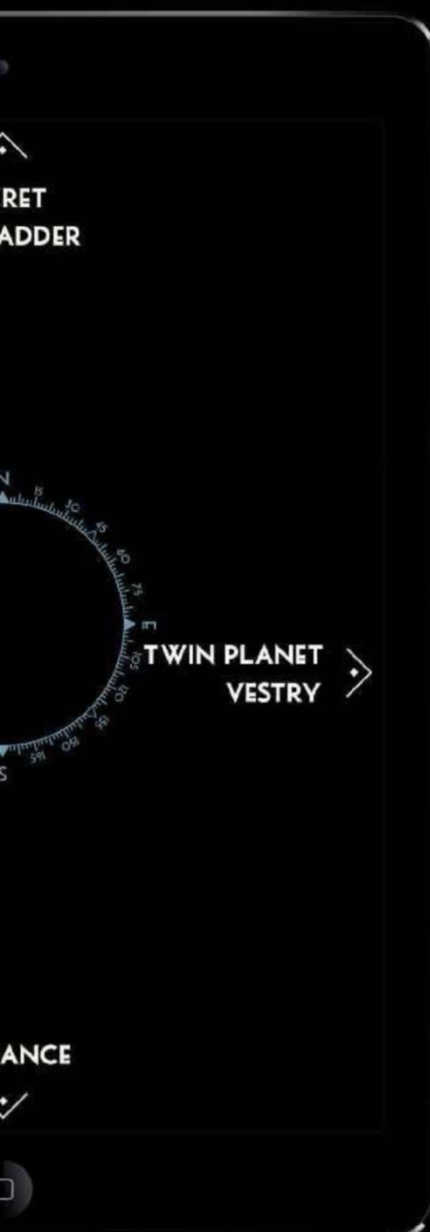
After an animated book-like opening – a title card, an ocean

backdrop, a shanty playing over the lazily crashing waves – you're soon swiping to find structures to scrutinise, investigating mazes of corridors, rooms and narrative.

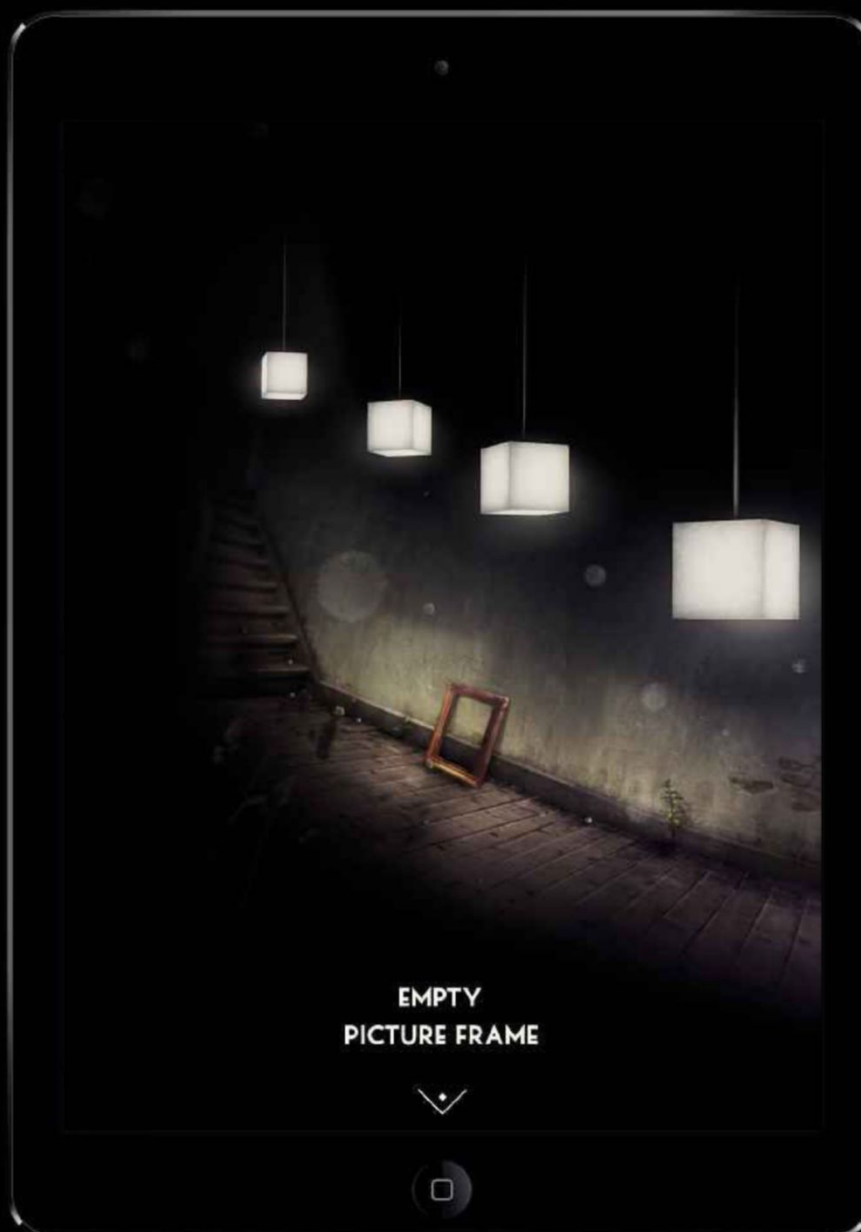
Challenges and rewards come from deciphering events from the tatters you discover, some of which require visits over hours and days to capture. It's not so much gameplay as pottering.

The app's artistry is stunning. Visually, it borrows from *Device 6*





**Lost?** Choose a dotted pathway through the darkness. Navigation is fractured, like the tale



**Ream** What's the significance of the hollowed frame? Swiping reveals a memory fragment

and Year Walk, but is more fluid. Sound design is arguably better still, from the echoes and snatches of dialogue to the elegant, haunting songs by Jonathan Eng and Stephanie Hladowski, all helping to unravel a submerged tale.

The story proves simple, though, and the experience is short if you don't allow yourself to linger. How much *The Sailor's Dream* grabs hold will depend on your demands from an adventure.

If you were put off by *Device 6*'s progression-hampering puzzles or *Year Walk*'s obfuscation, this may be a more congenial way to experience a Simogo universe. But those wanting more agency might feel short-changed, especially since the tale is quite conservative compared with its unorthodox predecessors.

Still, there's a romance here that the developer has only touched on before; and the entire

title, like its wistful soundtrack, has an understated beauty, permeated with sadness. Despite the slight, fragile nature of *The Sailor's Dream*, there's a boldness in Simogo's attempt to bottle magic in an app. **CRAIG GRANNELL**



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## Meet Mac Help

*We talk to Dave Steele about his nationwide telephone support service for Mac users*

DAVE STEELE IS no new kid on the block. Operating Mac Help out of an office near the station in Leamington Spa, he has been providing expert support to Mac users for 26 years. Formerly operating solely locally, Dave now provides 90% of his services via remote desktop to businesses nationwide, ranging from one-man startups to large design studios and print production facilities.

'Remote support has revolutionised my business,' says Dave. 'I can help more customers more quickly and more efficiently than ever before.'

In the support business since 1988, he has retained loyal support from his customers for over 20 years. Each client's needs are unique and he still supports legacy software and OS versions.

London typesetter Antony Gray says: 'Dave is always available to dig us out of the holes in which we find ourselves from time to time. Our lifeboat service.'

As well as providing support for all of Apple's bundled software, Dave also offers a 'how to' service for Microsoft products and Adobe's Creative Suite. He supports all version of the Mac OS and is happy to report a successful roll-out of Yosemite and iOS 8. iPhone and iPad support is a growing part of Dave's business.

Not all of Mac Help's work is remote. Located in the Midlands transport hub, Dave is perfectly placed to make visits across the south east. Several London customers have come on board, receiving regular visits, and he continues to service Hampshire clients.

Data management and backup is also becoming increasingly important to Dave's work. 'I find customers need help navigating the confusing array of cloud services,' he explains. 'People are no longer in control of their data.' From the trivial to the complex Mac problem, Dave at Mac Help is waiting for your call. Contact him at [machelp.org.uk](http://machelp.org.uk)

# MAC HELP

### Mac Help

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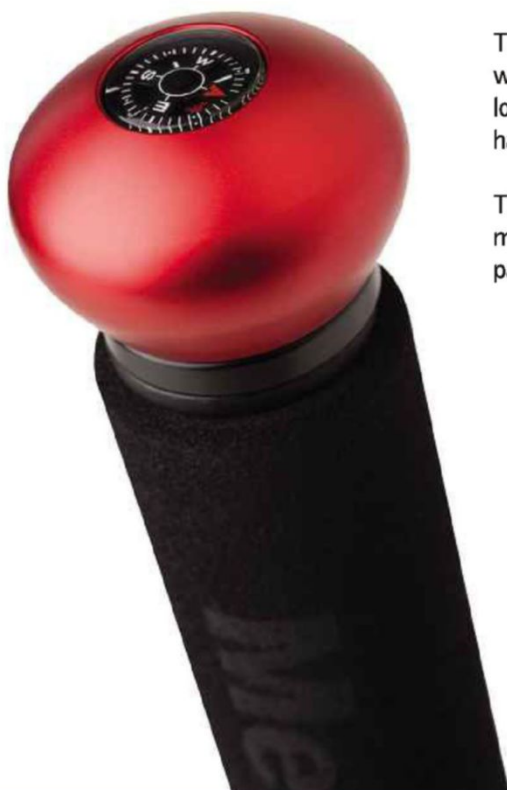


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The SideKick360 features an aluminum Arca-Swiss style base that works natively with our full size tripods such as the Backpacker, RoadTrip and GlobeTrotter as well as any Arca-Swiss style quick release clamp. The base also has three 1/4"-20 threads and a single 3/8"-16 thread allowing it to be mounted to a variety of quick release plates, monopods and handles.



Further information on the complete range of MeFoto products can be found on our new website  
[www.mefoto.co.uk](http://www.mefoto.co.uk)



The **NEW MeFOTO WalkAbout** is a 5-section monopod and walking stick available in 12 colours. It features rubberised twist locks that are weather and dust-resistant. Each unit comes with a hand strap and colorful compass knob.

The WalkAbout has load capacity of 14 kg, and features a 1/4-20 mount making this ideal for point and shoot, mirrorless and compact DSLR cameras.





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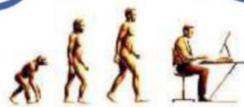
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IMAGE ANDY WELCH

## **Mac rescue** Macintosh SE/30

One of my customers (as a Mac training consultant) was clearing out some of their Macintosh stock in the early 1990s, and the opportunity to give a Mac a home was too much to ignore. Following brief negotiation, I parted with £50 for an SE/30 and carry case. Bargain!

Named after its 68030 chip, the SE/30, built in Cork in 1989, has never stopped working and in fact has never crashed in all this time. Believe me, it's true. With the exception of Adobe Type Manager 3.6, and RAM Doubler software (making 10MB altogether) to take advantage of the huge 20MB hard disk, she's as she left the factory. Even the floppy drive has barely ever seen a straightened paper clip attack; its ejection action is still as smooth as ever. The popping out of a floppy disk is something today's children are missing out on.

But I digress. After I moved out of IT training and consultancy, my SE/30 stayed loyally on my desk. As new Macs came and went, the SE/30 was ever-present. An iMac (2007) continues to serve us well, but the SE/30 shows no signs of abating. Although her tasks have mainly become cosmetic,

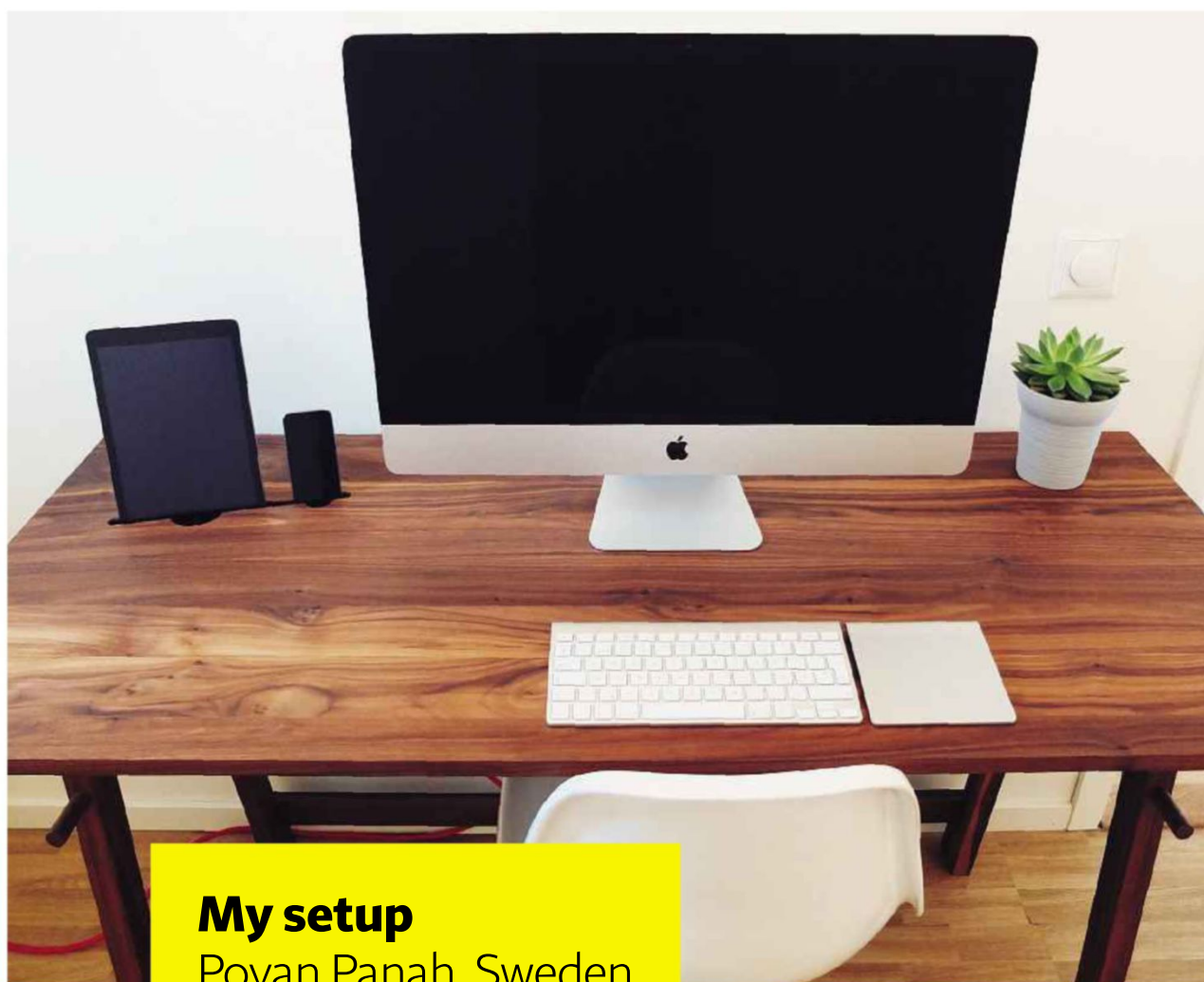
the delightful start-up chime still reverberates whenever I feel the need for a bout of 1990s nostalgia. As a challenge, I run Excel 4 and Word 5.1, just to see if I can undertake most tasks using these long-forgotten versions. And the answer is yes, I can do most of what I (and many other users) need to do every day with this 25-year-old machine. Technology – the more it changes, the more it stays the same!

One limitation is that the SE/30 no longer connects to the internet. She used to be hooked up to the World Wide Web in the 1990s, but now prefers to keep things local.

As I write, the new Apple of my eye (see what I did there?) is my MacBook Air. A delightfully streamlined machine, its slimness, its metallic finish, its weight are all things that may turn heads. But the SE/30 is still my idea of personal computing. She starts rapidly and runs at a pace that puts many new models to shame.

And I have no doubt she will continue to do so for many years to come. Probably longer than I will! I'm in love with an SE/30. ANDY WELCH





## My setup

Poyan Panah, Sweden

This is my 27in iMac (Late 2012) running OS X Yosemite. It has a 3.4GHz Intel Core i7 processor with 8GB RAM. The GPU is an NVIDIA GeForce GTX 675MX. I use the Magic Trackpad sometimes, but mostly I'm comfortable with the Magic Mouse.

I got my first Mac at age 7 or 8. I wanted one instantly after playing with our Macintosh Classics at school, and I've been a proud Mac user ever since – proud of acknowledging and appreciating such great technology. I admired Steve Jobs for his accomplishments and his struggle. Now that I'm 30 years old and working for the Swedish police, my passion for Apple products has only grown. I've had every iPhone since the launch of the very first one, which I had shipped to me from the US. I like what I've seen of the Apple Watch, too.

My first Mac was a Performa 630. Later I got a Power Macintosh 5500, then a Mac mini, a unibody MacBook Pro, and now this iMac. I'm planning to upgrade to the Retina iMac.

As a young boy, I mainly used my computer for gaming. Back then not many people had computers, so we did all our homework with pen

and paper. Printers were *really* expensive, so that wasn't an option, and the internet came later.

I still use my setup to play some old nostalgic games, such as Bungie's Myth 2 and Counter-Strike: GO. I also listen to Spotify a lot while browsing the web, and I watch movies, sometimes streamed to my TV via the Apple TV. I also edit my own skate videos and such in iMovie, which makes it easy and fast. I use iPhoto for photos, and it's kind of sad that it's going to be discontinued, but I'm sure Photos will replace much of its functionality. I use Pages when I need to write and edit documents, including my CV, which landed me a job!

I have dedicated Spaces for Mail, Calendar, Safari and so on, and a separate desktop for Twitter, IRC (in the Terminal app) and Messages.

My desk was inspired by the Artifax Desk 01. I had it made in walnut. The device slots incorporate a hole so that I can charge them from a compartment below, where I also keep external drives.

Also in my office is a Macintosh 128k, which I bought on eBay. It's a functioning unit with the Apple team signatures. I just had to have one.



## Woofers and tweeters

### Thoughts from the interweb

#### Quick learner

↑ Mark Riley

To mailbox@macuser.co.uk



Just wanted to say thanks for the Swift intro article in the latest issue (p82, MacUser, November 2014, £2.70 from bit.ly/macuser3012). I felt like it was written especially for me, having requested it in a previous mail, even though I know from your reply that you already had plans for this!

Please could you pass on my thanks to the author, Lou Hattersley, for this very well researched and written piece, suitable for those with a casual interest as well as those with more experience in coding and/or app development. And thanks

for devoting enough pages to this piece to ensure it was properly covered, rather than the one-page lip service paid to such topics by other Mac magazines.

Though there were plenty of links to follow-on material, Lou's article has left me thirsty for more on Swift. Is there any possibility you might commission some further coverage?

I have a problem that I'm finding hard to solve using established apps on the Mac (like Numbers and the now sadly unsupported Bento), so I figured writing my own simple app in Swift might be a better approach. I'll let you know what I come up with.

**Thanks Mark, we'll pass that on to Lou. And we will consider more coverage of Swift, especially if we**

**get positive feedback from other readers too. But we can't promise a return to the golden age of 8-bit micro magazines, when you'd type in a nine-page code listing and get a relational database with a text-based adventure built in.**

#### Wrong to be forgotten

Bryan Hyde

To mailbox@macuser.co.uk



Is there an index to past issues of the magazine?

**No. And by that we don't mean 'Yes, we have exactly such a thing right here on our desktop, but we're not going to make it available to the likes of you.' We mean that, due to a number of accidents of history, office moves,**



format changes, CMS upgrades, storage switches and general lack of time and minions, we're ashamed to say there currently is no system anywhere that searchably lists the articles in every past edition of MacUser. But you know, Bryan, we should all try to look forward not back, yeah?

Seriously, though, if you recall a particular item but can't remember which issue it was in, you can browse back issues at [bit.ly/macuserbackissues](http://bit.ly/macuserbackissues) to jog your memory, or feel free to tweet @macusermagazine or email [editor@macuser.co.uk](mailto:editor@macuser.co.uk) and ask. A combination of our collective memory and Spotlight on the local archive storage will usually produce an answer for you. Just try not to send us off hunting for articles that actually appeared in Macworld, Caravan Weekly, etc, as a tetchy response may offend.

## Sic transit gloria mini

**MacUser** @macusermagazine

🐦 Bad news about the new Mac mini: no longer has user-upgradable RAM. Disappointing.

**Paul Dunning** @spikescloneRSS

@macusermagazine Bummer. The

first thing I did to my mini was to up the RAM from Crucial.

**Jon Bradbury** @jonbradbury

@macusermagazine Bought last gen mini over iMac as more user upgradable.

**Daniel Bert** @verticalis

Absurd. Upgradability is a chief reason to buy a mini.

**Neil Turner** @spikescloneRSS

@macusermagazine I'm surprised at the lack of quad core chips. Only dual core. Very disappointed.

**Neil Turner** @spikescloneRSS

@macusermagazine I've a quad core i7 now. Newer chip, but dual-core is a downgrade in my eyes. Strange choice from Apple.

## To me, to you

**David Glen Walker**  
@davidglenwalker

🐦 Is anyone sending anyone else audio messages then?

**MacUser** @macusermagazine

@davidglenwalker One day they'll make it so you can both speak at the same time, like live, it will be dope

**carlo prina** @carloprina

@davidglenwalker personally just waiting to share my heart beat

**David Glen Walker**  
@davidglenwalker

@carloprina with another early adopter near a plug

## In their fifth element

**Super Tino** @supertino

🐦 The 5K iMac is an iOS developer's dream come true. Imagine running a pixel perfect Retina iPad simulator and having room to spare and work!

**ourmanincumbria**  
@ourmanincumbria

Need a 5K iMac. Beautiful.

## Might he?

↓ **David Glen Walker**  
@davidglenwalker

🐦 Hands up who's still pronouncing it 'Yosser Might'!



IMAGE YOSEMITE SAM PROPERTY OF WARNER BROS

IMAGE: MACUSER, 21 MARCH 1997 • PHOTOGRAPHY BY HUGH THRELFALL



## Apple moment

### The clone wars

Apple survived the ousting of Steve Jobs in 1985, and with the evolution of the Mac range and the launch of the first PowerBook in 1991, it looked as if the company's early promise might be realised after all. But CEO John Sculley's obsession with the Newton proved an expensive distraction, and replacing him with the notoriously indecisive Michael Spindler in 1993 didn't help. By the middle of the decade, pursuing a unique vision had begun to look more like self-indulgence than genius, and Apple was instead seeking sensible partnerships with more conventional players.

Forming the AIM alliance with IBM and Motorola enabled Spindler to launch the Power Macintosh in 1994, giving the flagship hardware a new lease of life. But sales were still just a few percent of a market dominated by IBM-compatible PCs. How

could a single manufacturer compete with a whole ecosystem of cloners?

With clones of its own, Spindler decided. For years, companies had popped up buying or reverse-engineering the Mac ROM chips that enabled Apple's operating system, building them into their own hardware and selling it as a cheaper alternative to Apple's. Apple had used every technical and legal method at its disposal to suppress them.

Now it actively sought cloners, and signed licensing deals to take a cut – the model IBM had failed to set up a decade earlier, losing it almost all of the revenue generated by its invention. It looked like a shrewd move. MacUser's ad pages were soon full of names like Power Computing, StarMax and UMAX. UK dealer Computer Warehouse launched its own range of '100% MacOS compatible'

systems, featured on our 21 March 1997 cover as 'Killer clones'.

But it was the clones whose days were numbered. CW's promise of 'Maximum performance, minimum cash' reflected an inevitable price war: cloners had to undercut Apple, then each other, and Apple in turn was driven to compete on price. While MacOS's market share climbed, Cupertino's profits fell, and mass layoffs loomed. In an editorial, I proposed the ironic slogan: 'Macintosh. The poor man's IBM-compatible.'

By this time Spindler had been replaced by Gil Amelio and Amelio by Jobs, bringing Apple – and its attitude to quality and cost – full circle. Within the year, cloning was over, the official announcement of its demise precipitated by the awkward questions of a certain computer magazine. But that's another story. ADAM BANKS





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